W6BHZ

AN INTRODUCTION TO

Operating an Amateur Radio Station

• Fifty Cents

Code Proficiency • DXCC

Public Service • RTTY

Contests • W1AW

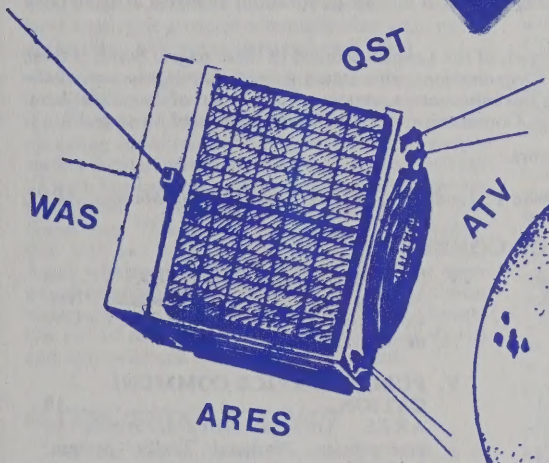
QST

RCC

WAS

ATV

ARES



Operating An Amateur Radio Station

Including Information on Emergency Communications and ARRL Field Organization

Forward

Better than doing something at all is doing something well. Over a period of many years, radio amateurs have developed a set of operating procedures that have come to be accepted as standard practice.

For nearly fifty years, *Operating an Amateur Radio Station* has set that standard of operating excellence for radio amateurs. As such it has come to be known as the "bible" of correct operating procedure. We think it fitting that the League through this publication should preserve these operating practices.

Although there is plenty of room for individuality and originality in your day to day operating, the League has exercised its responsibility to forge a set of operating standards that have come to be recognized by radio amateurs everywhere.

You will also find this publication to be a useful reference in providing organized emergency preparedness communications, and third-party traffic handling. The extensive operating programs to foster these activities are described herein, as well as the many operating awards and activities sponsored by the League. We hope you will find this a useful guide in your everyday operating.

For more information on operating, we recommend two sources: the *Public Service Communications Manual*, available free to League members on request (please include a self-addressed stamped envelope with two units of first-class postage); and the *ARRL Operating Manual*, a for-sale publication, available at radio book counters or directly from ARRL Headquarters.

You will also find the extensive operating program of the League detailed in these pages. Some of these activities fall into the League sponsored Field Organization, with status gained therein via one of the League's official appointments. If after reviewing this information, you want to be a part of the official family, an application form to be sent to your Section Communications Manager is provided on page 33.

A sincere "73" to you in your operating endeavors.

John F. Lindholm, W1XX *Communications Manager, ARRL*

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SIXTIETH EDITION. Free to ARRL members: price to others, 50 cents, postpaid.

I — OPERATING PRACTICE

Since Amateur Radio is so varied in its operating applications, establishing standard procedures has become very difficult, and many "hybrid" procedures have been used in the past and are being used today. Each mode, for example, has its own characteristics. Each band, depending on the principal use to which amateurs put it, accumulates devotees who use, or tend to use, procedures at variance with those put forth by the League as "standard." Actually, the standards are only recommendations of the League, based on literally hundreds of years of staff experience and thousands of years of members' experience. Very few of them have any definite relationship to regulations which, for the most part, say little about the forms and procedures amateurs shall use in communicating with each other. The material to follow is in the nature of ARRL *recommendations*. If we all follow them, we will have a better Amateur Radio. If we do not, we will have a polyglot group of communicators who, much of the time, will not understand each other.

Why you might ask, should this be so, particularly on voice modes? It is so because even on voice there are prescribed methods of indicating certain operating conditions — methods other than simply stating them in words. For example, one doesn't say "I have finished my transmission and now wish you to transmit," one says "over," or "go." One doesn't say "I would like to establish communication with any amateur station," one says "CQ." Along with recommended practices, there are other practices which are discouraged, and so it is almost as important to learn what not to use as what to use. On cw, of course, the need for procedural signals and abbreviations is even more prevalent.

ESTABLISHING CONTACT

The best way to do this, especially at first, is to *listen* until you hear someone calling CQ, and call *them*. This requires a little patience, but that's something else all amateurs must learn if we are to share our bands in harmony. Tune around near your own frequency. If you hear a CQ, put your vfo on that frequency *(without* putting a signal on the air), wait until he indicates he is listening, then call him, thus: "AB1U, AB1U, this is W1OD, W1 Oscar Delta calling, Over." On cw: AB1U AB1U DE W1OD W1OD AR. If no answer (to anyone) this may be repeated; brief, repeated calls are preferred to long drawn out ones. Chances are, if he is to hear you at all, he will hear your first brief call; most amateurs seldom tune far from their transmitting frequency to listen after a CQ. Note the ending signals. These have a special significance of their own to indicate to a casual listener the "status of the contact."

In answer to your call (assuming you are heard), the called station will reply: "W1OD from AB1U, roger . . ." and then go into conversation. On cw, it would be W1OD DE AB1U R. . . That "roger" (R) means that he has received your call correctly. That's *all* it means—RECEIVED. It does not mean correct, I agree, I will comply. It is not sent unless everything was received correctly. Note also that "roger" is the phonetic equivalent of the letter R only in this usage. The regular phonetic for R is "Romeo."

Perhaps AB1U heard W1OD but did not catch his call. In this case, he might come back with "The W1 station, please repeat your call, this is AB1U, over." On cw: QRZ W1? DE AB1U AR. The presence of interference (QRM) and atmospherics (QRN) in the amateur bands makes use of this procedure fairly frequent. The contact (QSO) can then continue. Please note the FCC requirements on identification (97.87).

CALLING CQ

If you hear no CQ, you may wish to make such a call yourself. Refrain from CQing unless you are willing to establish contact with whomever calls. CQ means "I wish to contact *any* amateur station." If this is not your desire, then don't CQ, or be specific in doing so. A CQ call can be somewhat longer than a call to a specific station, because you are trying to attract the attention of casual listeners, including those tuning around looking for someone to call. However, please avoid the common operating discrepancy of calling CQ endlessly; it clutters up the air and drives off potential "customers." The average call would go something like this: "CQ, CQ, CQ, calling CQ, this is N6TR, November Six Tango Romeo, calling CQ and listening, go." On cw: CQ CQ CQ DE N6TR N6TR K. After a brief standby for replies, if no one answers and the frequency is still clear, you can try again. Short calls and frequent standbys are the best way to establish contact with the minimum of QRM. This kind of procedure is easy to use when using VOX or keying through your VOX relay, or using cw break-in procedure.

COURTESY

One thing that is considered the height of ill manners and marks one as a "lid" is to tune up or make any transmission on a frequency which is already occupied. In some cases this is necessary, in others inadvertent: but it should always be avoided where possible. For example, if you are committed to a legal one-way transmission or schedule with a friend on a certain frequency at a certain time, it is sometimes unavoidable to cause temporary inconvenience to a going contact or even a net. In another situation, you may not hear another station on the frequency because of "skip," in which case an inquiry "Is the frequency in use?" or, on cw, QRL? should be used. Note: some old-timers use "didit dit" to inquire if the frequency is in use. An affirmative response on phone is a simple "Yes" and on cw C. Use the same procedure in tuning up your antenna (use a dummy antenna for testing your rig)—don't *ever* fire up the rig and start tuning it without first turning on the receiver and checking the frequency. The amateur bands are crowded; consideration for the other guy will make things better for everybody.

THE QSO

During the contact, be sure to observe the FCC identification rules (see ARRL *License Manual*). Keep everything on a friendly and cordial level, remembering that the conversation is not private and many others, including possibly members of the lay public, may be listening. Try to avoid the habitual utterances, procedures and inanities which so often make Amateur Radio contacts boring—things such as the drawn out "ahhhhhh" to keep the VOX relay closed, or repeated "double dash" (dahdidididah) sign on cw, or hackneyed expressions such as "there" (referring to the other fellow) and "here" referring to yourself, or "we" when you mean "I." Both on cw and voice it is possible to be informal, friendly and conversational, and this is what makes an Amateur Radio QSO enjoyable. During the QSO, when you stand by *the* recommended signal is "go only" on voice, $\overline{\text{KN}}$ on cw, meaning that you want only the contacted station to come back to you. If you don't mind someone else breaking in, just "go" or K is sufficient. Of course, by using VOX or break-in the conversation can proceed as it would face to face, without ending signals after each transmission; this is more common in a voice contact than in a cw QSO.

ENDING THE QSO

When you decide to end the contact, *end* it. If the other fellow indicates a desire to end it, don't keep on talking, don't say "I won't hold you," then hold him. Express your pleasure at having contacted him and sign out, thus "WB1ACZ from W3AZD, clear." If you don't want further contacts, say "clear and leaving the air." On cw, it's $\overline{\text{SK}}$ WB1ACZ DE W3AZD, and, if leaving the air, CL.

All these things establish Amateur Radio as a cordial and fraternal hobby at the same time they foster orderliness and denote organization. Most of them have no legal standing; FCC regs say little about our internal procedures. The procedures we ourselves adopt are even more important than that, because they indicate that we are not just a bunch of hobbyists playing around in random fashion, but that we are an established communications *service* with distinct and distinctive procedures tailored to our special needs.

REPEATER OPERATING

Amateur repeaters are widespread in use and operating through them is different from casual operating on lower frequency bands. While specific standards will vary depending on the particular repeater you are using, a few general principles can usefully be set down here:

1) Don't call CQ on a repeater. Just say "This is W1NJM monitoring." Anyone listening who then wishes to call will do so.

2) Long calls are totally unnecessary, and clutter the repeater. Your own call is all that's needed. But when signing out, be sure to give the call of the station you are talking with *and* your call.

3) Don't "key up" a repeater without identifying. This is common practice, but it's as selfish and thoughtless as it is illegal.

4) Don't break into an ongoing contact unless you have reason to do so. And in that case, drop your call between the transmissions of the other stations.

5) During a repeater QSO keep your transmissions *short.* (Some repeaters are timed and will shut down when the time has expired—you'll be talking to yourself.)

6) Leave a two- or three-second pause between transmissions, in case someone wants to break in. Could be an emergency!

The list of detailed "do's" and "do nots" is almost endless, but most of them boil down to two basic essentials—common sense and common courtesy. Most repeaters are open to all amateurs; all one has to do is transmit on the input frequency. (Some repeaters have limited access, but they are in the minority.) If we behave ourselves, the tendency to limit repeater use to specific groups or clubs will stay low. Remember, it cost someone a lot of time and effort to activate a repeater; use it, but don't abuse it. When you use it, you are a guest of the repeater operator. Act like one.

II — OPERATING ACTIVITIES AND AWARDS

To make amateur radio QSOing more enjoyable and to add challenge, the League sponsors many operating activities and awards for operating achievements. These can roughly be divided into those which directly serve the public interest, convenience and necessity and those which do so only indirectly by fostering more skillful operating and better operating practices. This booklet deals with the former in a separate section, and a separate booklet, *Public Service Communications,* goes into the subject in detail. In this section we will deal only with the latter subject.

AWARDS

One of the easiest to get and most popular awards is the **Rag Chewers Club** certificate. All you have to do is converse with another amateur for a half hour or more and report the conversation to ARRL Headquarters. Back will come your certificate. The RCC certificate is the average amateur's first introduction to ARRL services. Members of this fraternity of conversationalists may end their CQ calls with the letters RCC to indicate they are interested in something more than a "hello-goodbye" type of contact. The RCC is a free service of ARRL to all amateur licensees. An s.a.s.e. (at least 10x4") will expedite your certificate.

With suitable effort any amateur operating the high-frequency bands can achieve the **Worked All Continents** (WAC) award, sponsored by the International Amateur Radio Union. Two-way confirmed contacts must be made with amateurs in

each of six continental areas of the world: Africa, Asia, Europe, North America, Oceania, and South America. Special versions of the award are available for working all continents on each of five or six bands after January 1, 1974. U.S. and Canadian amateurs may obtain details on the WAC awards from ARRL Headquarters,* and send their cards (not copies!) there for checking. Applicants in other countries send cards to their IARU-member amateur society, which will certify their eligibility to the IARU headquarters society (ARRL) for issuance of the award on behalf of the Union.

The **Satellite DX Achievement Award** is offered for demonstrated proficiency using the OSCAR communications satellites. Contacts count made on or after Dec. 15, 1972. (Note, only one award per applicant station.) The cards (no photocopies) must confirm two-way communication via the OSCAR satellites, plus usual QSL information. 1000 points are required for this award. Each contact with a new station counts 10 points, with a new country 50 points, with a new continent 250 points. Please include sufficient funds for the safe return of the cards. Application forms are available from ARRL Hq.*

The **6-Meter "600 Club" Award** counts contacts made on 6 meters on or after January 1, 1977. A minimum of 600 points is required. Scoring is based on the sum of QSOs (times 2), ARRL sections (times 6) and countries (times 25). Some of the scoring areas are complex so be sure to send an s.a.s.e. for the rules before you submit your cards.

The **Worked All States** award is among the more popular, and is available to all amateurs, U.S. or foreign. As the name implies, it requires two-way confirmed contact with each of the 50 states. Here are the rules:

1) All contacts must be on amateur band frequencies.

2) Contacts may be made over any period of years, but all must be confirmed in writing, preferably in the form of QSL cards (not copies). Confirmations must show your call and definitely indicate that two-way contact was established. Contacts made with Alaska and Hawaii prior to their dates of statehood (Jan. 3, 1959 and Aug. 21, 1959 respectively) cannot be counted.

3) Contacts made through "repeater" devices or any other power relay method cannot be used.

4) All confirmations and QSL cards must be accompanied by sufficient postage for their return.

5) A W/VE must be an ARRL member to participate in the WAS program. (DX stations are exempted from this requirement.) Sufficient funds must be included for the safe return of cards.

6) Cards must be placed in alphabetical order by state and a separate list furnished of calls, dates, bands and modes. This is also a part of the application form, CD-217.*

7) Endorsements for specialty operation (all SSB, 160-meters, QRP, etc.) are available but endorsements must be requested at time of applying for award and all 50 cards must confirm endorsement indicated.

8) Confirmation of contacts with amateurs in the District of Columbia count for Maryland. Contacts with U.S. possessions not a part of a state cannot be counted for WAS.

9) Contacts must all be made from the same location, or from locations no two of which are more than 50 miles apart. Provided the above rule is observed, the call used is immaterial provided it is licensed to the applicant.

10) This award is available to club stations provided all confirmations show the club call.

11) All applications should be addressed to the ARRL, 225 Main St., Newington, CT 06111.

A special **Five-Band WAS** award is available to those amateurs who can show written confirmations of contacts with all 50 states on any five amateur bands. Its purpose is to encourage the development of more versatile antenna systems and equipment, provide better occupancy of all amateur bands and a challenge for old timers as well as newcomers. Here are the rules:

1) The 5BWAS Award is available to all licensed amateurs, except that in Canada, the United States and possessions, and Puerto Rico, the applicant must be a full member of ARRL.

2) The 5BWAS will be issued after checking submissions of confirmations representing two-way communications with the 50 United States on each of five Amateur Radio bands. Phone and cw segments of the band do not count as separate bands for this award.

3) Confirmation showing contacts by any legal mode will be accepted. However, no contacts made by cross-mode or cross-band are acceptable, nor will endorsement for mode be given or indicated. Contacts using repeaters or repeater satellites are not acceptable.

4) Application for 5BWAS must be made on the appropriate form supplied by ARRL. Sufficient funds must be included with application for the safe return of the cards. Please send s.a.s.e. for application and postage return fees.

5) Only written confirmations will be accepted. No credits will be given for confirmations via contest logs.

6) Only confirmations showing a contact date of *Jan. 1, 1970,* or later will be accepted for credit for this award.

One of the most sought-after awards in Amateur Radio is the **DX Century Club,** issued to amateurs who can submit confirmations of contacts with 100 or more "countries" in accordance with a standard list prepared by the League and designated CD-216.

Because this award is so highly sought after by amateurs all over the world, and because a special effort has been made through the years to keep the standards high, the rules are very specific and

*An s.a.s.e. would be appreciated and will expedite your application.

therefore somewhat complicated. We detail them herewith but suggest interested applicants check recent issues of *QST* for the possibility of any changes made since this printing.

These rules are effective for contacts made since November 15, 1945 for the general type (CW/F) and the Phone DXCC. For the CW DXCC, contacts must have been made since January 1, 1975.

1) The DX Century Club Award, with certificate and DXCC lapel pin, is available to amateurs worldwide.

2) Confirmations must be submitted direct to ARRL Headquarters for all countries claimed. Claims for a total of 100 or more countries must be included with first application.

3) The ARRL Countries List criteria printed on the DXCC List will be used in determining what constitutes a "country."

4) Confirmations must be accompanied by CD-164 and CD-253 to aid in checking and for future reference.

5) Confirmation from additional countries may be submitted for credit, for total countries between 100 and 240, in groups of 20 or more or where the new total will be exactly divisible by 20; for total countries between 240 and 300, in groups of 10 or more or where the new total will be exactly divisible by 10. For total countries over 300, submission in groups of 5 or more or where the new total will be exactly divisible by 5. Endorsement stickers for affixing to certificates will be awarded as additional credits are granted. These stickers will be in exact multiples of 25 between 125 and 250, multiples of 10 between the 250 and 300 levels, and in multiples of 5 above 300.

6) All contacts must be made with amateur stations working in the authorized amateur bands or with other stations licensed to work amateurs.

7) In case of countries where amateurs are licensed in the normal manner, credit may be claimed only for stations using regular government-assigned call letters. No credit may be claimed for contacts with stations in any countries in which amateurs have been temporarily closed down by special government edict where amateur licenses were formerly issued in the normal manner.

8) All stations contacted must be "land stations." Contacts with ships, anchored or otherwise, and aircraft, cannot be counted.

9) All stations must be contacted from the same DXCC "country."

10) Contacts may be made over any period of years from November 15, 1945, provided only that all contacts be made under the provisions of Rule 9, and by the same station licensee; contacts may have been made under different call letters in the same area (or country), if the licensee for all was the same.

11) Any altered or forged confirmations submitted for CC credit will result in disqualification of the applicant. The eligibility of any DXCC applicant who was ever barred from DXCC to reapply, and the conditions for such application, shall be determined by the Awards Committee. Any holder of the Century Club Award submitting forged or altered confirmations must forfeit his right to be considered for further endorsements.

12) Operating Ethics:

(a) Fair play and good sportsmanship in operating are required of all DX Century Club members. In the event of specific objections relative to continued poor operating ethics, an individual may be disqualified from the DXCC by action of the ARRL Awards Committee.

(b) Credit for contacts with individuals who have displayed continued poor operating ethics may be disallowed by action of the ARRL Awards Committee.

(c) For (a) and (b) above "operating" includes confirmation procedures.

13) A W/VE must be an ARRL member to participate in the DXCC program. (Novices and DX stations are exempted from this requirement.) Application for any of the DXCC awards should be made on the appropriate form supplied by ARRL. Sufficient funds must be included for the safe return of cards ($1.50 UPS within the 48 states, $5.50 for the first-class registered mail within or out of the 48 states).

14) A 160-Meter DXCC was established in 1976, covering contacts made since November 15, 1945. This is a one-time only award, no endorsements are offered.

An RTTY DXCC was also established in 1976, under the terms above. This too is a one-time only award without endorsements.

A Satellite DXCC was established beginning October 3, 1977, to a station submitting 100 or more confirmations of contacts made exclusively by satellite. Pertinent DXCC rules will apply. This DXCC award will not be endorsable.

15) Decisions of the ARRL Awards Committee regarding interpretation of the rules as here printed or later amended shall be final.

16) Address all applications and confirmations to ARRL, 225 Main St., Newington, Conn., U.S.A. 06111.

A **Five-Band DXCC** award has been established to encourage more uniform DX activity throughout the amateur bands, encourage the development of more versatile antenna systems and equipment, provide a challenge for old timers as well as newcomers to DXing, and enhance amateur band occupancy. Here are the rules:

1) The 5BDXCC Award is available to all licensed amateurs, except that in Canada, the United States and possessions, and Puerto Rico, the applicant must be a full member of ARRL.

2) DXCC Rules 6, 7, 8, 9, 11, 12, 15 and 16 shall apply to 5BDXCC; DXCC Rule 10, with substitution of a date of January 1, 1969, shall also apply. Anyone disqualified from 5BDXCC under DXCC Rule 11 shall automatically be disqualified from DXCC. Anyone disqualified from DXCC is not eligible for 5BDXCC.

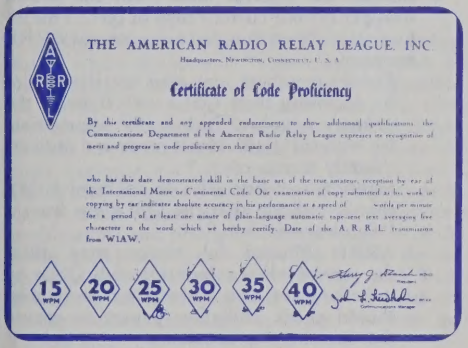
3) The 5BDXCC Award will be issued after checking submission of a minimum of 500 different confirmations representing two-way communications with 100 different "countries" (per the ARRL DXCC List in effect at the time of application) on each of five amateur radio bands. Phone and cw segments of the band do not count as separate bands for this award.

4) Confirmations showing contacts by any legal mode will be accepted. However, no contacts made by cross-mode or cross-band are acceptable, nor will endorsement for mode be given or indicated. Contacts using repeaters or repeater satellites are not acceptable.

5) Application for 5BDXCC will be accepted only if submitted completely on a standard form supplied by ARRL Hq. A W/VE must be an ARRL member to be eligible to apply. DX stations are exempted from this requirement. Sufficient funds must be included for the safe return of cards ($2.25 UPS within the 48 contiguous states, $8.25 for first-class registered mail within the 50 United States, and $11.00 elsewhere).

6) Only QSL card confirmations will be accepted.

7) Only confirmations showing a contact date of January 1, 1969, or later will be accepted for credit for this award.


THE AMERICAN RADIO RELAY LEAGUE, INC

Certificate of Code Proficiency

15 WPM 20 WPM 25 WPM 30 WPM 35 WPM 40 WPM

The League operates a code proficiency program and issues a **Code Proficiency Award** at speeds from 10 through 40 wpm, in 5 wpm increments. The program is implemented largely through Headquarters station W1AW, which transmits daily practice on all amateur bands, 160 through 2 meters, and twice each month transmits a certificate-qualifying run on the same frequencies, in place of the code practice. W60WP (W6ZRJ alternate) supplements the W1AW program by transmitting a qualifying run once per month for the benefit of west coast amateurs, some of whom may have difficulty copying W1AW. Code proficiency award certificates do not give you credit for the FCC code test, but if honestly obtained they usually make it easy by comparison and are good for point credit in the Novice Roundup.

Code Proficiency certificates are available at 10, 15, 20, 25, 30, 35, and 40 wpm to any person who submits qualifying copy at any of these speeds. In order to qualify, the copy must show a legible one minute (out of the five-minute transmission) of consecutive solid copy. Once you have your certificate, it can be endorsed to show progress upward as you increase your speed through practice. The endorsements are in the form of attractive stickers. Proud can be the amateur who first qualifies at 10 wpm and can show a lineup of six stickers on his certificate indicating his achievement of 15, 20, 25, 30, 35, and 40 wpm in subsequent qualifying runs. Check *QST* Contest Corral column or send s.a.s.e. and request Code Proficiency schedule.

In order to promote a high calibre of operating in the amateur bands, ARRL sponsors an **A-1 Operator Club.** To become a member, one must be nominated by two operators who already belong. Originally set up for cw operators in the 1930s, the A-1 Club now includes operating in all phases of Amateur Radio, in accordance with the following point system: (1) *General considerations.* On cw, formation of characters and good spacing (speed is not a criterion). On voice, clearness of speech, brevity, good choice of words. (2) *Procedure.* Short CQs, avoidance of unnecessary repetition, use of proper pro-signs and pro-words and abbreviations recommended by ARRL, avoidance of the common inanities in making contacts. (3) *Judgment and courtesy.* The operator should be courteous and willing to consider the other fellow's point of view. He should take every opportunity to assist other operators, especially beginners. He should be patient and helpful at all times. (4) *Copying ability.* This applies to phone as well as cw, for there is a knack to copying both, and to getting the information down accurately on paper through such difficulties as interference from other stations (QRM), atmospheric noises (QRN), fading (QSB), etc.

The four factors, encompassing both skill and personality, are applicable to all phases of Amateur Radio. Any *particular* phase of operating embraces the four basic points, plus certain additional considerations allied with the specialty. For example, the traffic operator would be weighted on his traffic-handling ability, the DX operator on his operating skill in "snaring" the elusive ones (without, of course, resorting to unethical practices), the contest operators on his skill in rattling off contacts swiftly without trampling on fellow contesters and giving the impression of peremptoriness, etc. The A-1 Operator Club is not based on "winning." It is based more on "how you play the game."

No one asks for a nomination to the A-1 Operator Club. It comes as a spontaneous recognition of your value as an amateur operator by two of your fellow amateurs who have already made the grade and find you qualified to be a member of this exalted fraternity. Asking for a nomination might automatically disqualify you.

Another award that is not asked for, specifically worked for, or expected is the **Public Service Award.** This comes as a spontaneous recognition of your performance in a communications emergency or a non-emergency public service event. Awards are issued on the basis of those who were reported to be "outstanding and meritorious," usually upon recommendation of a League official. No one is slighted or cheated because he does not get a PSA. The honor of receiving one is, rather, an unsolicited pleasant surprise.

The **Old Timers Club** membership is issued to any amateur who had an amateur license 20 years or more ago, and is one award not issued *unless* applied for. Send us the year of your first license; if 20 years or more ago, you're in. OTC members may sign "OTC" after their calls to indicate their seniority.

Amateurs who qualify for the **Brass Pounder's League** (BPL) receive a card certificate from the SCM each month they qualify, and a *BPL Medallion* from Headquarters the third time. In order to achieve these awards, a certain amount of traffic must be handled each month (per information in each current issue of *QST*). The BPL certificate may be issued to club or multi-op stations, but the medallion is available only to the station licensee who must personally handle all the traffic to qualify. All traffic must be handled in the amateur bands, using standard ARRL form and totals must be duly reported to the SCM and recorded in *QST*. A monthly *QST* listing also includes all amateurs who "made" BPL for the month reported in the Public Service column.

Another honor listing called the **Public Service Honor Roll** is included in each issue of QST. Points towards this listing are recorded for reporting into ARRL-registered public service nets, for serving as assigned net control of same, for serving as liaison station on an assigned basis between such nets, for handling phone patches, for "making" BPL, for handling emergency traffic and for serving as net manager. All points must be reported to your SCM at the end of each month. (CD 210). A limit to the number of points which can be claimed for each of the above functions makes it impossible to make PSHR by doing only one thing, thus encouraging versatility in public service operating. A PSHR certificate is offered with the requirements included with the PSHR box in each issue of *QST*.

ARRL DX QSL BUREAU SYSTEM

When you contact a DX station and ask for his QSL card, he probably will answer that he will "QSL via bureau." This means that he intends to take advantage of a low-cost method of sending his card to you known as the QSL bureau system. In each call area of the U.S. and Canada, volunteers operate clearing-houses for the distribution of DX QSL cards to amateurs in their area. To receive cards sent to you through the bureau all that you need do is send a s.a.s.e. (self-addressed stamped envelope) to the bureau serving your area. The addresses and further details are in *QST* every other month indexed under "ARRL QSL Bureau." Because of the numerous sorting operations involved and the slowness of international surface mail, it isn't unusual for a card sent via the bureau system to be several months in transit.

This part of the ARRL system is for incoming cards only. For outgoing cards, ARRL maintains the Membership Overseas QSL Service.

ARRL—MEMBERSHIP OVERSEAS QSL SERVICE

Purpose: This is an "outgoing" service that allows ARRL members to send DX QSL cards to foreign countries at a minimum of cost and effort.

Advantages: While QSLing direct to foreign amateurs is faster, it is also more tedious. Time spent searching for addresses in the foreign Callbook, addressing and stuffing envelopes, and mailing could be better spent operating DX. And, the cost of IRCs, airmail postage, and envelopes can be prohibitive.

An unlimited number of QSLs may be sent for distribution 12 times per year. The fee is just $1.00 per pound or portion thereof (155 QSL cards average a pound).

Additional Notes: The ARRL-Membership Overseas QSL Service operates ONLY in an "outgoing" capacity. To receive QSLs from DX stations, request the information sheet entitled The ARRL DX QSL BUREAU SYSTEM.

U.S. amateurs may send SWL reports to foreign short-wave listeners.

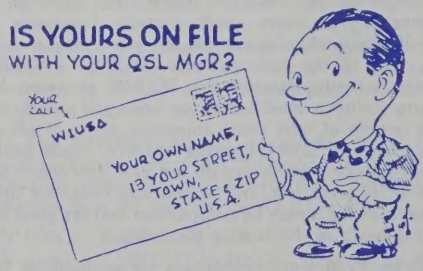
Unlicensed (associate) members may send SWL cards to foreign amateurs.

QSL managers: Write for details.

Requirements

1. Pre-sort your DX QSLs alphabetically by callsign prefix (A3, AP, C6, CE, F, FG, G, GI, GM, JA, 3A2, etc.).
2. Enclose the address label from the brown wrapper of your current copy of *QST*. This information shows that you are a current ARRL member.
   Family members may also use the service by enclosing their QSLs with those of the primary member. Include the appropriate fee with each individuals cards and indicate "family membership."
   Sightless members who do not receive *QST* should indicate that the QSLs are from a "sightless member."
   ARRL affiliated club stations may utilize the service when submitting club QSLs by indicating the club name. Club secretaries should check affiliation papers to ensure that membership is current.
3. Enclose payment in the form of a check, money order, or cash.

Sending large amounts of cash through the mail is not suggested. Please do not send stamps.



CONTESTS

Capitalizing on the competitive spirit, contesting is very popular in Amateur Radio, with many con-

tests being conducted, nearly one every weekend. Some are sponsored by foreign societies, some by amateur clubs, some by commercial magazines. Those mentioned herein are all sponsored by ARRL and administered through the Contest Branch of the ARRL Communications Department. We take them in chronological order:

The first contest in *January* is the **VHF Sweepstakes,** usually the second weekend. As the name implies, this contest is for 50 MHz and above only, and the object is to work as many stations on as many different vhf bands as possible. The multiplier is the number of different ARRL sections worked. The contest includes a club-competition feature in addition to individual competition. The purpose of the VHF-SS is to enhance vhf amateur band activities.

Also in *January* is the first of three **CD Parties** held during the year—in January, April, and October. These contests are open to ARRL field organization appointees and to certain other ARRL officials. As in nearly all operating contests, the object is to work as many other eligibles as possible, exchanging certain information and again using ARRL sections worked as multiplier. Stations may be worked on each band, but sections count only once. The April CD Party is open to all ARRL members as well as the regular eligibles. The purpose of the CD Parties is to encourage a higher spirit of fraternalism among League appointees.

During *February* we have the **Novice Roundup,** during which Novice and Technician operators are encouraged to make as many contacts as possible. All classes of licensees may participate, but those who are not Novices or Technicians may work only Novices or Technicians. Each contact counts one point, and may not be repeated on different bands. To the total contacts is added the ARRL code proficiency credit (equal to the wpm of the operator's certification) and multiplied by the number of different ARRL sections worked. The Novice Roundup is intended to introduce Novices and Technicians to ARRL-sponsored activities and encourage other amateurs to work Novices and Technicians.

The third weekend in *February* hosts the popular **ARRL International DX Contest** on cw. In this contest U.S. and Canadian stations work the world, while DX stations work W/VEs or other DX stations — though the premium is on W/VE contacts. The multiplier is the number of DXCC countries worked per band. ARRL-affiliated clubs may enter the club competition. Many plaques are awarded to top scorers in the several categories, such as all-band, single-band, QRP, and multioperator. The phone section of this contest is conducted in *March.*

The only big contest activity in *March* is the phone weekend of the DX Contest. In *April,* comes **"Open" CD Parties,** in which all ARRL members are eligible to participate. This is, in effect, an "ARRL QSO Party." In addition the EME (moon-bounce) contest is held during one weekend. It is designed to encourage the development of amateur EME equipment for the ultimate DX QSO. Multipliers are the U.S. and VE call areas, plus DXCC countries. In *May* the second weekend of the EME event is held.

June is the month of a **VHF-QSO Party.** While in most places the weather does not permit outdoor portable operation in the January VHF-SS, in June it is ideal and many vhfers take advantage of this opportunity to "mountain-top." Rules for this contest permit repeat contacts on the different vhf bands, and the multiplier is the total number of sections and DXCC countries worked on each band.

The next really big weekend is the annual **Field Day,** perhaps the most popular of all ARRL contests and one of the most unique. On the last *full* weekend in *June* amateurs all over the U.S. and Canada take their gear into the field, set it up and proceed to make as many contacts as possible under rules which provide various entry classifications, power and independence-from-mains multipliers and bonuses for quick setting up and publicity. This is principally a group rather than an individual competition. The purpose of Field Day is primarily to encourage emergency preparedness on the part of amateur clubs and other groups, although through the years it has become one of the fiercest competitions in Amateur Radio.

In *July* we have the **IARU Radiosport Championship.** This is a contest designed to promote international amateur radio solidarity. The International Amateur Radio Union is the world-wide organization for Amateur Radio to which the ARRL belongs and serves as Headquarters for. The Radiosport Championship was designed to insure that the competition would be international. The multipliers are the ITU zones (once per band). QSOs with stations on different continents count the most but QSOs between amateurs in your own country also count. In other words, everybody can work everybody else!

Early *August* brings the **UHF Contest** for contacts on the bands 220 MHz and above. Multipliers are each "one degree latitude/longitude block." Contacts are worth more points per band the higher in frequency you go.

In *September* comes the **September VHF QSO Party** very similar to the June VHF QSO Party and representing a late-summer "repeat" of the June early-summer contest. Scoring and rules are the same.

In *October* another **CD QSO Party**, then in *November* the big month of the **ARRL November Sweepstakes** contest, generally known as the SS. This is one of the biggest of them all, in which all amateurs in the U.S. and possessions and Canada are eligible to participate. There are two weekends, one for phone and one for cw, and the multiplier is based on the ARRL Field Organization of 73 sections plus VE8/VY1. A form of message preamble is transmitted as an exchange, in which the first number is the number of your QSO, consecutive starting with No. 1 — so you will know how many QSOs each station has had prior to his contact with you. The SS differs from other contests in that it has a longer and more difficult exchange than most of them, designed to educate participants in the form of a standard ARRL message preamble. Separate classifications include those above and those below 200 watts input (400 watts PEP), although stations in the two classifications may work each other. No duplicate contacts may be made on separate bands, however.

And to wind up the year in contests, *December* is the month of two single-band contests—the **160-Meter Contest** and the **10-Meter Contest.** The 160-Meter Contest, which occurs first, is a cw-only event designed to enhance 160-meter occupancy. This was started in 1970. The first year for the 10-Meter Contest was 1973 and it has proven to be very popular. Specific rules for these two contests are announced in *QST*.

These are but a few of the many contests in which amateurs engage during the year. Others are listed each month in the "Contest Corral" in *QST*. Rules for ARRL-sponsored events and for other contests usually appear in the issue of *QST* for the month prior to that in which the event occurs—that is, for example, the SS rules will appear in October *QST*. Additionally, a detailed writeup and score summary for each ARRL contest appears in *QST* some months following the event, depending on the amount of work involved in preparing it. Previous to a contest one plans to enter, send a request (with s.a.s.e.) to Headquarters for log forms.

OTHER OPERATING EVENTS

The annual **Simulated Emergency Test** is conducted in *October*. This is not a contest, but ranks high in importance in the year's operating calendar because it represents both a test of our own organizational effectiveness as a public service and a public demonstration of our capabilities along this line. The "score" of each group that participates is based on number of participants, agencies represented, publicly received, number of mobiles and portables free of commercial mains in operation, and similar criteria—but there is no inter-group competition as such. The idea is to better your previous scores and to make a sizable contribution to the national point total. Each local Amateur Radio Emergency Service group simulates an emergency condition and goes into operation accordingly. The National Traffic System is tested by origination of traffic by participating ARES groups and individuals. NTS is activated on a "simulated emergency" basis to enable handling of such traffic more swiftly than normal, just as it would be under real emergency conditions.

A different kind of competition is the **Frequency Measuring Test.** FMTs are held on a Friday or Saturday night in early February, May, September, and November at 10 P.M. and 1 A.M. Eastern Time. The early FMT run replaces the regularly scheduled code practice transmission. Approximate frequencies and times for measurement are listed in the "Contest Corral" section of *QST*. A commercial laboratory specializing in frequency measurement takes measurements at the same time and sends the results to Headquarters, where they are announced over W1AW and later published in *QST*. FMTs are for the benefit of Official Observer appointees to enable them to qualify for precise frequency measurement, but the program is open to all interested in testing their frequency measuring skill. Results are listed in *QST* with degree of accuracy indicated.

Straight-Key Night is held in December. This is a cw-only affair and requires use of a straight key. SKN starts at 0001Z on the evening of December 31 (rules in December *QST*). The object is to have leisurely QSOs with other participants, not to rattle them off contest style. An award is given to the person voted to have the best fist during the contest.

DXCC has been covered previously, but it should also be mentioned that a continuing competition exists and is reflected in *QST* by listings showing stations with a number of "countries" credited. An annual listing of current DXCC endorsement holders appears in the December issue. DXCC is only the first step in DX accomplishment. Between that and acquisition of the Five-Band DXCC there is the continued striving for additional "countries" which can be added to your record and reflected in *QST* listings. The first 100 countries are the easiest. After that, they start coming harder, and by the time you reach 200 you have entered the ranks of the real hard-core DXers. Over 300, you are among the elite.

Also deserving mention as an operating activity is the **ARRL Code Proficiency Program.** This has assisted thousands of would-be amateurs to obtain their amateur tickets and to improve their speed to enable them to obtain higher-grade licenses. The program consists of code practice transmitted from W1AW four times a day on week days and three times daily on Saturday and Sunday.

III — HANDLING MESSAGES

The handling of message traffic was the basis for the formation of ARRL, and a sizable segment of amateurs still makes this its principal Amateur Radio operating activity. Amateur message service does not compete with other services, since there are no charges and can be no guarantee. Provided FCC and international regulations are complied with, messages may be accepted from anyone for sending by Amateur Radio.

What constitutes "legal" messages, or any other kind of third party communication, has been a matter of considerable discussion and various interpretations throughout the years. The pertinent regulations sections are 97.3b, which defines an amateur operator as being a person "without pecuniary interest;" 97.112, which forbids any renumeration or other kind of compensation for use of an amateur station; and 97.114, which details certain prohibitions on third-party traffic.

Generally speaking, unimportant, personal, non-business messages may be exchanged between different countries only after a special agreement has been reached between the countries. A list of countries which have signed such agreements with Canada and with the U.S. appears frequently in *QST*. In addition, most countries do not object to actual emergency messages being handled in the amateur bands if goverment or commercial facilities are not available at the time.

Individual amateurs handle messages in a number of different ways. Some are "free lancers"

who handle their traffic on individual schedules without recourse to regular nets. Some of these originate most of their traffic (from military or naval training installations or other mass sources) while others devote their primary activity to "relaying" traffic originated by others. Most traffic operators, however, participate in nets of various kinds. The largest organized system of nets is the ARRL National Traffic System about which more later. Others include networks organized by individuals for traffic-handling purposes in which individual amateurs participate out of preference. Government agency networks, Red Cross nets, and similar agency-organized amateur nets usually have general traffic handling only as a sideline to their principal purposes to serve the agency concerned. MARS nets handle message traffic, but this work is done outside the amateur bands and uses a special military form of procedure.

From the earliest beginnings of Amateur Radio the League, as the standard-bearer for Amateur Radio, has recommended forms and procedures for message handling. These have changed from time to time, largely at the behest of the amateurs participating in this phase of the service, and today are accepted by most amateurs and quite a few of the non-amateur agencies sponsoring amateur organizations.

An amateur message is first originated, then relayed and finally delivered. In order to set down proper procedures for each, let us follow these steps in chronological order.

ORIGINATING A MESSAGE

Any amateur can originate a message on behalf of another individual, whether such individual be a licensed amateur or not. It is the responsibility of the originating amateur, however, to see that the message is in proper form before its first transmission, because under most circumstances it is improper for a relaying or delivering station to make changes. Therefore, under "origination" we discuss message form.

Each message originated and handled should contain the following component parts *in the order given:*

(a) Number	(g) Time filed*
(b) Precedence	(h) Date
(c) Handling Instructions*	(i) Address
(d) Station of origin	(j) Text
(e) Check	(k) Signature
(f) Place of Origin	

*Optional with originator

a) Every message transmitted should bear a number. Keep a sheet with a consecutive list of numbers (beginning at 1) at your operating position. When a message is filed at your station for transmission, complete all parts of the preamble except the number, leaving this blank. When you send the message, assign a number to it from the number sheet, crossing out numbers on the sheet as they are used and making a notation, after the number, of the station to whom the message was sent and the date. Such a system is convenient for quick reference purposes. Most traffic handlers start with number 1 at the beginning of each year.

b) Every message has a precedence in amateur procedure. This will normally be "Routine" (R). It is a separate part of the preamble and is transmitted as such, not as part of the number. Other precedences are "Emergency" (never abbreviated), "Priority" (P), and "Welfare" (W). A set of definitions for ARRL precedences and how to use them is contained in ARRL Form CD-3, in every ARRL log book and available for the asking from ARRL (CD-218).

c) Handling Instructions (HX) are available prosigns for use when or if desired by the originator or the originating station, whenever special instructions are required in the handling of the message. A list of HX prosigns is included in CD-218.

d) The "station of origin" is the call of the station from which the message was first sent by Amateur Radio and is included so that handling stations will be able to communicate with the originator if something interferes with the prompt handling or delivery of the message.

e) The "check" is the number of words and numerals in the text of the message. Handling stations should agree on the check before the message is considered handled. Full information on checking messages is given later.

f) The "place of origin" is the name of the place (city or town) from which the message was started, *not necessarily* the location of the station of origin. The preamble of a message filed at League headquarters in Newington, Conn., might read as follows: NR 457 R W1INF 21 NEWINGTON CONN 2057Z JUNE 11.

If a message is sent to your station by mail or otherwise not filed in person, the preamble should show the place the message originally came from. If the message came to League Headquarters by mail from Wiscasset, Maine, the preamble would read: NR 457 R W1INF 21 WISCASSET MAINE 2057Z JUNE 11. Any message received at an amateur station by any means other than Amateur Radio is an origination when put on an amateur circuit by that station.

g) The time filed is the time at which the message is received at the station from which it is to be sent. Standard practice is to use UTC. This part of the preamble is optional with the originating station.

h) The month and the day of the month that the message was filed at the originating station. The year is not included. If the filing time is UTC, be sure the date agrees.

i) The address is the name, street and number, city and state of the party to whom the message is being sent. The telephone number should be part of the address. A complete address should always be given to insure delivery. When accepting messages for origination this point should be stressed. In transmitting the message by cw the signal $\overline{AA}$ is used to separate parts of the address and the address is followed by **BT** or "break" before the text is started.

In street addresses where the words east, west, north, south are part of the address, spell out the words in full. Suffixes "th," "nd," "st," etc., are not recommended. Example: "19 W 19th St"

should be "19 West 19 St." It is not good practice for the relaying station to change address format, but the originating station should observe the above practices to insure clarity in retransmission.

j) The text consists of the words in the body of the message. No abbreviations should be substituted for the words in the text of the message. The text follows the address and is set off from the signature by another **BT**.

k) The signature is usually the name of the person originating the message. The signature follows the **BT** or "break" at the end of the text. The abbreviation "sig" is not transmitted.

After the signature, say "end of message" or transmit **AR**. If more to follow, say so. On cw, use the prosign **B**. If no more, say so; on cw use the prosign **N**.

Counting Words In Messages

The amateur message "check" is the count of the number of words in the *text only*. It is essentially an "as sent" count. While it is assumed that the rules of grammar and spelling will be followed, the check count is determined principally by the spacing used by the transmitting operator in sending the text. Since the first operator to transmit the message is the operator of the originating station, who enters the check in the preamble, this check should carry through to destination. The relaying operator has no authority to change the check unless it is definitely determined that the check as he received is incorrect, then he should confirm with the transmitting operator before making the change. When such a change is made, the *original* check should remain in the preamble. *Example:* an original check of 10 corrected to 9 would be sent "10/9" on cw.

The check is a means for insuring the accuracy and completeness of your copy. It also indicates to the receiving operator how many words the message he is about to copy will contain. Inclusion of "check" in a message preamble is *not* optional.

All number, ciphers, mixed groups and punctuation each count as one in the check, regardless of length. It is recommended amateur practice not to use punctuation, fractions or other unorthodox or seldom-used code symbols in messages as such, but rather to spell these out when used in the text of a message to avoid complications in checking. The letter X or "X-ray" is used inplace of a period or semicolon and is counted in the check.

The principle of counting words as sent can be illustrated by a few examples, as follows:

F E Handy	3 words
New York City	3 words
NYC	1 word
6L6G	1 word
A6ZB1	1 word
Fifty six	2 words

A few rules have to be observed in sending words so this principle of "counting as sent" will not be abused:

1) Make your spacing methodical and accurate on both phone and cw.

2) Follow the dictionary wherever possible.

3) *Do not waste time in traffic nets arguing about "how to count."* The purpose of the "check" in amateur work is to confirm the number of words or groups in the text. QTB is a useful signal in confirming check. Once you are sure that you have copied it correctly, QSL (on cw) or "roger" (on phone) the message and get on with the next one, correcting the check when you relay the message.

In copying traffic, whether by pencil o. typewriter it is quite easy, with a little practice, to count the words in the text as you copy. When using pencil, copy five words to a line. At the end of the message, you can readily figure the number of words by the number of lines (plus how many words over) you copied. By typewriter, it is more convenient to copy ten words to a line, and this can easily be done by copying five words, hitting the space bar twice (instead of once), copying five more words, then linespacing to begin a new ten-word line. At the end of the message a glance at the number of lines will show you how many words you copied. You can then query the sending operator if your figure does not agree with his.

When traffic is heavy and time is precious, it is not considered advisable practice to query a check unless you have reason to believe that a mistake was made, either in sending or copying.

ARL Check

Messages containing ARRL numbered radiogram texts (see Form CD 3) have the same form as any other message, except that the symbol ARL is used before the check. This symbol indicates that a spelled out number in the text of the message refers to a complete text bearing that number on the ARL list. The check following this symbol is, as on all messages, the actual count of the words in the text as sent. A simple cw example of such a message: NR 1 R W1AW ARL 3 NEWINGTON CONN MAR 2 (Address) BT ARL FIFTY FOUR BT JOHN AR. On phone, of course, the prosigns would be replaced by the appropriate prowords.

If any station relaying the message does not have an ARL list, it is necessary to substitute the complete text for which the number in the text stands. In the above example, in such a case, the ARL would be omitted from the check, the check would be 6 instead of 3; the text would be: MANY THANKS FOR YOUR GOOD WISHES.

ARL texts can be used along with other words in the text, if desired. In this case the ARL would appear in the preamble to indicate that such a text is included in the text of the message and again the check would be a count of the actual words in the message. Suppose the originator of the above message wanted to add the words "Everyone here is fine" to the above message. This would change the check to ARL 8 and the text would then read: ARL FIFTY FOUR X EVERYONE HERE IS FINE.

In delivering a message with an ARL text, one of course delivers the complete text. It is therefore very necessary that the symbol ARL be included with the check to avoid the possibility of delivery of a meaningless number to the addressee.

Use of ARL text is a special tool for special occasions. When used, it should be used properly to avoid delays and confusion on the part of handling stations.

Book Messages

The "book" form of message may be used when two or more messages have identical parts. The principle involved is very simple. Those parts which are identical (the "fixed" parts) are sent first; then those parts which are different (the "variable" parts) are transmitted. Instead of starting with a message number (which is always one of the variable parts in a book), first indicate the number of messages in the book. *Example:* You have four messages which are all identical except the number and the address. These can be transmitted as one "book" on cw as follows:

BOOK OF FOUR R W1NJM 20 NEWINGTON CONN DEC 30 BT

HOPE YOU WILL FIND AN OPPORTUNITY TO HANDLE SOME TRAFFIC DURING THE SIMULATED EMERGENCY TEST ON OCTOBER 5 X 73 BT HART W1NJM BT

NR1 W HUDDLESTON K4SCL AA 219 DRIFTWOOD LANE AA LARGO FL 33540 BT

NR 2 FRANK BUTLER W4RH AA 323 ELLIOTT RD SE AA FORT WALTON BEACH FL 32548 BT

NR 3 ANDREW B CLARK W4IYT AA 41 LENAPE DR AA MIAMI SPRINGS FL 33166 BT

NR 4 WILLIAM FARONE N4NK AA 210 MIDFIELD RD AA BON AIR VA 23235 AR END BOOK AR N

On phone of course the cw abbreviations in the above examples are not used. Pauses in speech can be substituted for BT and AA, and abbreviations can be said in words. The above book message might be sent on phone as follows: "Follows a book of four routine, W1NJM 20, Newington, Connecticut, December thirty. Break. Hope you will find an opportunity to handle some traffic during the simulated emergency test on October 5 X-Ray. Seventy-three. Break. Hart, W1NJM. Break. Number one, initial Whiskey Huddleston I spell . . . (etc.).

It is good procedure to convert received messages into book form for relay if feasible and to separate them into complete messages if they are to be sent to different stations. It is bad procedure to use the word "same" in transmitting any message.

TRANSMITTING THE MESSAGE

Transmitting the message for the first time applies both to orignated messages and messages that have been received for relay. Let's assume you have found a station to receive your message, either by your own efforts to find one or as a result of having been told by a net control station to transmit it to so-and-so. You call him, he says he is ready to receive (QRV). A voice example would go something like this: "Copy message number fifteen, routine, W1NJM, ten, Newington, Conn., two one five one zulu, April twelve. Mrs. Judy Smith, one nine zero eight Moon Street Northeast, Albuquerque, New Mexico, eight seven one one two, telephone two nine eight six four zero eight. Break. Mother and Dad arrived home safely Sunday afternoon X-ray love. Break. Uncle George. End of message, no more."

On cw, it would go like this: NR 15 R W1NJM 10 NEWINGTON CONN 2151Z APR 12 MRS JUDY SMITH AA 1908 MOON ST NORTHEAST AA ALBUQUERQUE NM 87112 AA 298 6408 BT MOTHER AND DAD ARRIVED HOME SAFELY SUNDAY AFTERNOON X LOVE BT UNCLE GEORGE AR N.

Phone operators use the proword "break" for separation of the address and signature from the text. It is incorrect procedure to use the words "going to" preceding the address and "break and the text" preceding the text.

Messages should be *sent* by voice, not read. That is, reading puts emphasis on certain syllables and words, and this means *de*-emphasis of others. In transmitting a message by voice, no word or syllable should be de-emphasized. Letting your voice fall at the end of a sentence as would be done in reading is poor practice in voice traffic work, as is letting your voice fall for unaccented syllables. You are not a broadcast announcer. Keep in mind that the receiving operator must put down what you transmit, completely and accurately.

Avoid such inanities during transmission as "Mrs., a married lady" or "Moon, opposite from Sun." They only confuse things and give a bad impression of our service. Avoid giving dates as "four, twelve, seventy." Just say "April twelve" and forget the year. (We hope no message will be over a year old!) Also, don't say "today's date." Spell all difficult or unusual words (e.g., "Ferrier, I spell F-E-R-R-I-E-R"). If the word is very difficult, unusual, or a group of letters not forming a word, spell it out using ITU phonetics (e.g. "NCOIC, I spell: November, Charlie, Oscar, India, Charlie.") Using phonetics excessively is poor procedure. Usually simply spelling the word is sufficient.

These are a few of the "do's" and "don'ts" of transmitting messages. There are many more, far too many to detail here. Your best guide is experience. Everybody makes mistakes at first. The Public Service column in *QST* each month frequently comments on good and bad current traffic handling procedures.

RECEIVING THE MESSAGE

Some of the problems of receiving have already been touched on above. The principal rule to follow is do not, repeat *do not* assume you have received a part of a message correctly if you are not absolutely certain. This is what causes most of the "garbles" in our amateur message handling. A single letter lost in a crash of static can completely change the meaning of an entire cw message, as can loss of an entire word by voice. Most operators are prone to "guess," and usually they guess right. But if you did not actually "copy" the missing part, it is taking a chance. Best to make sure.

Modern procedure, both on voice and cw, uses "break in." On voice, this usually refers to "VOX" procedure, in which the transmitting operator can pause long enough between words or phrases to let his VOX relay open, enabling the receiving operator to "break" if he misses something. On cw, the meaning of "break-in" is that the receiving operator can interrupt the transmission simply by pressing his key. In both cases, when one "breaks," he simply indicates the last word received correctly. For example, on voice, the receiving operator may miss the last word of this phrase: ". . . arrive on Sunday." He would simply say "on" and the transmitting operator would repeat "Sunday" and go on with the message. On cw, the receiving operator, after missing "Sunday," presses his key to interrupt the transmission, sends ON and the transmitting operator repeats SUNDAY and goes on with the message. "Break-in" procedure is strongly recommended for all message-handling.

If break-in is not used, it is necessary to get "fills." This makes it necessary for the receiving operator to note the parts missed and get the missing parts filled after the message has been completed. On voice, simply ask for "word after . . ." or "word before . . ." or if more than one word might have been missed "between . . . and . . ." On cw, the abbreviations WA, WB or BN are commonly used. When break-in is not used, it is common practice for transmitting stations to repeat (on voice "I repeat," on cw a question mark) difficult words, letters or groups.

Perhaps the second most prevalent cause of "garbling" of messages is poor handwriting. Many people cannot make out their own handwriting a day or more after it is written, and in some cases only an hour or so delay can erase the memory of what a scrawl is supposed to mean. The answer is to copy by typewriter. A little practice is all that is needed to be able to do this as easily as copying by pencil; usually it is faster, and always is more legible. If you must copy by hand, require the transmitting operator to send at a speed at which you can write *legibly;* don't scrawl illegibly because you don't want to admit you can't copy that fast. Copy five words or groups to a line by hand, ten (5 + 5) by typewriter, to enable an instant "check of the check." In fact, this is the origin of the word "check" for word count.

RELAYING THE MESSAGE

The rule is that received messages must be relayed or delivered within 48 hours after receipt. However, this is only a "counting" rule; for practical purposes, the rule is to relay or deliver the message *as soon as possible* after receipt. This means immediately if you have an outlet; otherwise, as soon as an outlet is available. The public is conditioned to "instant communication" and will be unimpressed with messages, even free ones, which are slower than the mail, and in some cases "slower than walking."

Relaying the message uses the same procedure as transmitting it already described above, but there are some principles that are applicable especially to relaying. For one thing, when you are relaying a message its contents are none of your concern. You take no action and make no changes, nor any comments on its contents, except in making sure you receive it correctly and relay it in the same condition. Neither do you judge its importance, except on the basis of the precedence assigned to it by the originating station. If you disagree with the precedence assigned, your argument is with the originating station, not necessarily the one sending the message to you.

Relaying stations are authorized to change the *form* of messages they handle, if incorrect when received, but not the content. Even spellings that appear to be obviously incorrect are best relayed exactly as sent; for all you know, the writer may have a purpose in spelling incorrectly. The best rule to follow in relaying is to relay the message exactly as you received it, after making certain that you received it correctly. If the station sending it to you is the originating station, *he* may change it if desired; otherwise, no changes (except in form) should be made.

DELIVERING THE MESSAGE

Delivery is the object of all message handling — that is, the culmination of all efforts in handling. A message should be delivered as soon as it is within non-toll telephone range. In amateur practice, of course, we use our judgment about such things. That is, one would not deliver the average message received on an amateur circuit in the middle of the night. If it is Priority or Emergency precedence, this would be a different matter, particularly the latter; in fact an Emergency precedence message (they should be quite rare) should be delivered by telephone immediately upon receipt, even long distance. But on the average, a message received after say 10 P.M. would not be delivered until the next day. Messages that cannot be delivered by telephone or in person should be mailed. It is also customary for a delivering amateur to offer to send a confirmation mail copy; after all, receipt of a message by Amateur Radio is somewhat a novelty.

The act of delivering an amateur message can be embarrassing or very satisfying, depending pretty much on the nature of the individual amateur. A number of articles on this subject have been written, but the principal point to be borne in mind is that in delivering the message, as in originating it, you are making contact with the general public and the impression you make is likely to be a lasting one. Talk clearly, explain who you are (give your call sign, too), and be careful to indicate that the message is a "greeting." Don't start out with something

ominous, such as: "I have a message for you." Say "I am an amateur operator and I have received a greeting message for you from . . ." Of course circumstances will alter cases, and the best advice is to put your best foot forward, be friendly and cheerful, speak clearly, offer to handle a reply.

RESPONSIBILITY

Amateurs who originate messages for transmission or who receive messages for relay or delivery are accepting the responsibility of clearing the message from their station on its way to its destination in the shortest possible time. No amateur is required to accept or handle a message. Once you have accepted one, however, it is your responsibility to see that it is relayed onward or delivered. It is strictly unethical in amateur practice to "dead end" any message. Any amateur who does so is playing fast and loose with a reputation for responsibility that other amateurs have worked for decades to establish.

COUNTING MESSAGES

All amateurs who handle traffic are invited to report their total message count monthly to their SCM (listed each month in *QST*).

For counting purposes, traffic is divided into four categories, as follows:

Originated: Any message originated by someone other than yourself, filed with your station for initial transmission on the air.

Received: Every message received by Amateur Radio at your station. This includes all messages received, whether received for relay or received for delivery.

Sent: Any message transmitted from your station by radio to another station, whether such a message was initially transmitted from your station or was received from another station.

Delivered: Any message delivered by you to the addressee, provided that the message was received at your station by radio and that the addressee is someone other than yourself. This delivery must be an off-the-air function (by telephone, mail, in-person, etc.).

The traffic total is the sum of originated, received, sent and delivered points. Note that in some cases the same message can be counted twice; for example, the same message received by radio and then relayed to another station by radio is counted both in the "received" and "sent" categories, while a message received by radio and then delivered is counted both in "received" and "delivered" categories.

When transmitting or receiving messages in book form, count one point for every *three* messages in the book, plus another point for any over a multiple of three. That is, a book of three messages would count as a single message, but a book of four, five or six would count as two, and a book of seven would count as three, etc. "Booking" of messages is a time-saving device for those who want to use it in the interest of efficiency. It is similarly perfectly proper procedure to separate booked messages into single messages if desired; that is, the transmitting station decides in what form they shall be sent, as long as it is proper. Each message, regardless of its content, deserves to receive separate treatment. Messages handled using unauthorized "short cuts" cannot properly be included in your traffic count.

SERVICE MESSAGE

Whenever a message is received which has insufficient address for delivery and no information can be obtained from the telephone book or the city directory, a service message should be written and sent to the station of origin asking for a better address. Service messages are also used to make any other inquiries concerning the status of a particular message the servicing station is holding. Since these communications are ham-to-ham, common amateur abbreviations are permissable.

When transmitting a service message, it is customary to indicate its nature by using the letters "SVC" preceding the number in the preamble. Service messages should receive the same precedence as the message they are servicing.

HANDLING TRAFFIC BY RTTY

RTTY would seem to be a "natural" for handling record traffic, and indeed some traffic is handled by this mode, but not nearly so much as you might expect. In the material above we have discussed message handling mostly as it applies to voice and cw modes. RTTY procedure introduces a whole new set of procedures. In view of the very specialized nature of RTTY traffic handling and the fact that relatively few amateurs use RTTY for this purpose at the present time (a pity, too!), we will not go into it in this amount of detail herewith. However, as a general principle it should be stated that the object of RTTY traffic handling should be to make the printed copy look exactly like a copy prepared for originating or relaying. That is, it should be devoid of prosigns, prowords or other symbols that would not appear on a handwritten or typewritten copy—because when you send RTTY traffic you are not using prosigns or prowords to tell the receiving operator what to write down. You are actually writing it down yourself. That is, you are not going through an operator, who can interpret; you are originating the impulses which actuate the machine at the far end. Since the operator at the receiving end may be reperforating, his copy should be in proper form for retransmission without retyping or manually reperforating.

RTTY is best suited for handling large quantities of traffic, rather than the two or three at a time that are usually handled by stations in cw and phone nets. In fact, RTTY is not well suited for nets at all. Thus, this mode would be ideally suited for long distance relays of quantities of traffic which can be taped and run through the transmitter-distributor. It also requires better conditions than does cw, although about the same as phone. When conditions are optimum and traffic is heavy from point to point, there is no better way to handle it than over a circuit equipped with RTTY at both ends.

Handling traffic on vhf RTTY eliminates some of the drawbacks of hf operation. Not only are signals reliable, but autostart is practical, making the handling of small quantities of traffic a reality.

ITU WORD LIST FOR VOICE WORK

(Phonetic alphabet adopted by the International Telecommunication Union.)

A	— ALFA	N	— NOVEMBER
B	— BRAVO	O	— OSCAR
C	— CHARLIE	P	— PAPA
D	— DELTA	Q	— QUEBEC
E	— ECHO	R	— ROMEO
F	— FOXTROT	S	— SIERRA
G	— GOLF	T	— TANGO
H	— HOTEL	U	— UNIFORM
I	— INDIA	V	— VICTOR
J	— JULIETT	W	— WHISKEY
K	— KILO	X	— X-RAY
L	— LIMA	Y	— YANKEE
M	— MIKE	Z	— ZULU

Natural words and phrases can be used instead of abbreviations and Q Code in voice work. Self-adopted words for phonetics are confusing. Intelligibility as well as pride in your procedure calls for use of a standard word list, used only as necessary, of course. Example: W8RC W 8 ROMEO CHARLIE.

IV — NETWORK ORGANIZATION

STARTING A NET

Amateurs can add much experience and pleasure to their own amateur lives and substance and accomplishment to the credit of *all* of Amateur Radio, when organized into effective interconnection of the cities and towns of a state, the states in an area in which coverage is desired, or other points.

The selection of suitable stations to be invited to work together is important. Operating ability is required. All individuals must be willing to contribute unselfishly to the success of the group objectives, permitting operations to be guided absolutely by the word of the net control station.

In selecting a suitable frequency, care should be taken to select one which will provide adequate coverage of the area in question, one which is not already occupied by another net at the same time, and one on which all net stations can operate.

The time of the net meeting should be selected for the convenience of the net members, and/or for best propagation conditions to effect the desired coverage. Consideration should also be given, of course, to the amount of other network activity at that time on or near the frequency selected.

The ARRL official or organizer should not organize nets of stations haphazardly merely because a group of congenial fellows at any old place happen to work on the same frequency. That sort of net might offer temporary fun but would not be likely to be generally useful or fulfill maximum possible good for amateur radio or the community at large. Get a map and set yourself an objective — then try to get stations in the cities and towns important to the coverage that is the organizational goal. Public service will be enhanced at the same time you get to know a bunch of operators that can become the very salt of the earth to each other. There will develop a justified pride in a smoothly working communications system, which is the joint property and cherished possession of each member of the group—a system beyond what any one member could create of his individual effort. Establishment of high morale and responsibility for the joint effort is the secret of circuit discipline, fun and SUCCESS.

NET CONTROL STATION

The efficiency with which network operation is accomplished depends almost entirely on the operating ability, signal strength, familiarity with procedure and mental agility of the Net Control Station — and therefore the net is no better than its NCS, no matter what the calibre of the operators in the net. A net control who cannot copy and send well wastes much time asking for and getting requests for repeats. If his signal is not loud enough to be heard by every net member, he must relay some of his instructions, which takes more time. If he is not familiar with the net procedure and proper message routing, he must spend some of the net's time making inquiries or referring to his list of "QN" signals. If he has to take time to figure out what instruction to give next and how to give it, the entire net must stand by until he has completed his cerebrations.

Duty as NCS may be assigned by the net to any station in the net which can best fulfill the duties. As operators become experienced they should have opportunity to serve as acting net control to familiarize each member with the duties and enable any of them to act in that capacity in case of necessity.

If an NCS or alternate should not take control within three minutes of the time set for beginning of drill, any station present should take charge and begin regular net operation, and remain in charge for the duration of the net. It is a waste of time for the acting net control to turn the net over to the regular NCS if the latter is late, and this should not be done if it can be avoided, for in turning over control it is necessary for the acting control to give the regular control the list of stations in the net plus the destinations of all traffic that has been reported in.

The NCS is charged with the clearing of traffic within the net, with the dispatching of internet traffic, and with maintaining order within the net. The authority of the NCS extends only to the operation of the net on the air, and is in no way concerned with the interior administration of the station, nor with its operation. Within its scope, however, the authority of the NCS is absolute, its decisions are final and its instructions are strictly COMPLIED WITH.

SUCCESS OR FAILURE OF ACTUAL NET OPERATIONS DEPENDS ON KEEPING THE NET OPERATING SWIFTLY AND SMOOTHLY BY EXERCISING THE POWERS VESTED IN THE NCS FOR THIS PURPOSE. NCS may break into net at any time if in his opinion it is necessary to aid functioning of the net; he may request any station to stand by in order to eliminate ragchewing, unauthorized transmissions, superfluous transmissions, to handle urgent or emergency traffic or situations, to eliminate QRM

from outside net, to direct traffic or for any other reason. NCS shall keep an accounting during each net period of what stations report in and what traffic they have.

On a phone net there may be a problem of maintaining discipline. There is inclination to ragchew because of the inherent nature of the mode of communication. However, if the net is to be respected by other amateurs it should show the proper restraint in this regard and its performance should exhibit snap and precision.

For Net Control Stations

1. Call the net promptly at the appointed time.

2. Keep a written record of the situation and traffic list of each member.

3. Know where each net member is located and what traffic he can handle.

4. Excuse from the net (within a certain agreed time limit) each member who is clear, and thereafter excuse members promptly when they are cleared.

5. Keep your key under control. Hasty sending is usually sloppy sending. If operating phone, speak with clarity and deliberate enunciation.

Some Rules for the Individual Net Member:

1. Transmit only when invited to do so by the NCS, even though you only wish to "help."

2. Report into the net promptly at the appointed time.

3. Answer promptly when the NCS calls you, and do not leave the net without first notifying the NCS that you are so doing.

4. Know your "Q" signals, especially your special "QN" signals and the phonetic alphabet. Keep them posted at your operating position (free upon request).

5. Save all personal remarks and conversation until the net is free (QNF).

NETWORK OPERATION

A theme of brevity in operating should be carried out in the entire set-up. The time for rag chewing is *after* the network exchanges are completed and the stations are free (QNF) instead of directed (QND) by the NCS. A net operating without any superfluous words in its operations will be automatically a much snappier and better all-around net. Every single word not absolutely needed may be dispensed with profitably.

A single net member can cause a great amount of confusion and delay by improper or ill-advised practices. He may report into the net at the wrong time; he may fail to give his traffic list (or indicate "QRU") when reporting in; he may break in without an invitation from the NCS; he may call or engage one of the other members in conversation without the permission of the NCS; he may fail to respond promptly when the NCS calls him; or he may leave the net without notifying the NCS. All these faults, some of them seemingly minor, waste a net's time, and the time wasted and confusion caused is multiplied by the number of net members who are "off the ball."

Some nets have been organized for purposes other than traffic handling, such as technical forums, award chasing, emergency drill, or just plain rag chewing, but practically always for any real communication purposes such as training, emergency, or utility to any agency, the fellows have come back to traffic handling as the real stuff of which communication is made. Nets in general cannot be successful if there is nothing to do. There must be some form of activity in which all member stations can participate, and traffic is admirably suited to this purpose.

Each member of the net should originate and handle his share of the traffic. Don't let one or two stations do all the work. If a particular net member has no outside schedule, reports into no other net, and originates no traffic himself, he has only himself to blame for the fact that he has little to do on the net.

The exact form of network operation varies with the purpose and coverage of the net, and with the amount of time available. It is always a good idea to get all net members together occasionally for a personal discussion of ways and means of effecting efficiency in the net, if such get-togethers are practicable. In general, nets to be effective should stick strictly to business while the net is directed by a net control station. A great amount of satisfaction can be derived from operation in a net of "savvy" (not necessarily fast) operators. Conversely, there is nothing so discouraging as operation in a net in which confusion and vacillation reign supreme.

ARRL QN SIGNALS FOR CW NET USE

QNA*	Answer in prearranged order.
QNB*	Act as relay Between...and...
QNC	All net stations. Copy I have a message for all net stations.
QND*	Net is Directed (controlled by net control station).
QNE*	Entire net stand by.
QNF	Net is Free (not controlled).
QNG	Take over as net control station.
QNI	Net stations report In.* I am reporting into the net. (Follow with a list of traffic or QRU.)
QNJ	Can you copy me? Can you copy...?
QNK*	Transmit messages for...to...
QNL	Your net frequency is Low.
QNM*	You are QRMing the net. Stand by.
QNN	Net control station is... What station has net control?

QNO	Station is leaving the net.
QNP	Unable to copy you. Unable to copy...
QNQ*	Move frequency to ... and wait for ... to finish handling traffic. Then send him traffic for ...
QNR*	Answer ... and Receive traffic.
QNS	Following Stations are in the net.* (Follow with list.) Request list of stations in the net.
QNT	I request permission to leave the net for ... minutes.
QNU*	The net has traffic for you. Stand by.
QNV*	Establish contact with ... on this frequency. If successful, move to ... and send him traffic for ...
QNW	How do I route messages for ...?
QNX	You are excused from the net.*
QNY*	Shift to another frequency (or to ... kHz) to clear traffic with ...
QNZ	Zero beat your signal with mine.

***For use only by the Net Control Station.**

Notes on Use of QN Signals

The QN signals listed above are special ARRL signals for use in amateur cw nets *only*. They are not for use in casual amateur conversation. Other meanings that may be used in other services do not apply. Do not use QN signals on phone nets. *Say it with words.* QN signals need not be followed by a question mark, even though the meaning may be interrogatory.

V — PUBLIC SERVICE COMMUNICATIONS

Amateur Radio exists because it qualifies as a service. Its continued existence depends to a great degree not on the service we have performed in the past, or on our simple potential for service, but on what we are performing now and will continue to perform in the future. Recognizing this principle, ARRL in 1935 organized what is now known as the Amateur Radio Emergency Service, in 1949 the National Traffic System. This combines the emergency-preparedness program of the ARES with the daily traffic-handling program of the NTS into a single strong facility for rendering continuous service to the public at the same time the emergency-preparedness program is kept always up to date by frequent drills and tests. In an emergency, the NTS serves as the vehicle for relay of traffic over medium and long distances while local ARES nets take care of local communications and deliveries. Close liaison is maintained between these two divisions.

This is not all there is to Amateur Radio public service, of course. In 1966, the ARRL Board of Directors recognized RACES, the Radio Amateur Civil Emergency Service, as a nominal part of the League's public service program. It, along with a number of other private agency, government and individual-amateur sponsored groups are recognized and supported by ARRL whenever possible, but the League does not presume to control their operation. Public service requires the participation of *all* interested amateurs in whatever way suits their individual inclinations. The League's formal program (ARES and NTS) is the largest and most extensive such program in existence. All amateurs are urged to take part.

THE AMATEUR RADIO EMERGENCY SERVICE

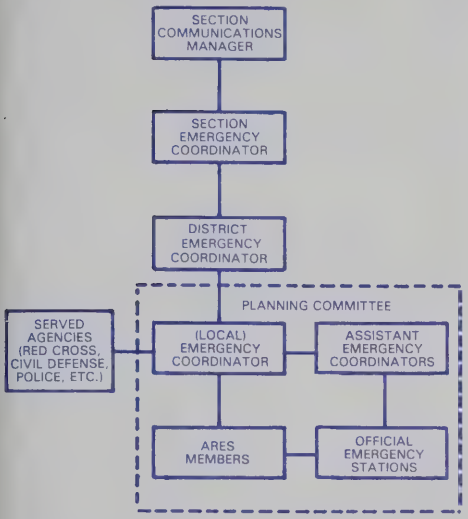
The Amateur Radio Emergency Service is composed of licensed amateurs who have voluntarily registered their qualifications and equipment for communication duty in the public service when disaster strikes. Every licensed amateur, whether or not a member of ARRL or any other local or national organization, is eligible for membership in the Emergency Service. The only other qualification is a sincere desire to serve. The possession of emergency-powered equipment is desirable, but is not a requirement.

Emergency service activities in each ARRL Section are under the direction of the Section Emergency Coordinator (SEC), appointed by the Section Communication Manager (SCM) as his representative in such matters. Groups of cities and towns (counties, civil preparedness districts or zones, etc.) are under the jurisdiction of the District Emergency Coordinator. The amateurs in each community within the Section register their facilities with the local Emergency Coordinator (EC) who, in turn, represents the Amateur Service in its dealing with civic and relief agencies.

Application forms for registration in the Amateur Radio Emergency Service are available from your local Emergency Coordinator, District Emergency Coordinator, your Section Emergency Coordinator, your Section Communications Manager or ARRL Headquarters. ARES registration does not constitute an official ARRL appointment; it is simply a registration of your facilities and availability for emergency work, which the local EC keeps on file to be used as a basis for his plans and his talks with local government and relief officials regarding local emergency communications problems. The registrant is issued a card (by his EC) signifying his membership in ARES.

Organization. The organizational chart shows the place of the emergency coordinator and the ARES members in the League's administrative setup for emergency preparedness. Note the importance of the community Emergency Coordinator in heading up the local ARES organization and in conducting liaison with civic officials and relief agencies. In some communities, especially large ones, this is a big job and requires some assistance. The EC therefore may wish to appoint assistants from among his Official Emergency Station (OES) appointees to assist him in various phases of his work. For example, where a large group of ARES members exists there are bound to be different in-

Amateur Radio Emergency Service
Organizational Chart



terest groups (by bands used, by areas or by interests such as repeater operation, mobile, portable, hand-carried, etc.). The wise EC appoints assistants from among each group, and meets with them occasionally to discuss over-all problems and aspects of the community situation.

As many OESs as possible should be familiar with the plans of the Emergency Coordinator and his committee. This will enable them to activate themselves without delay upon being notified, and to know exactly what to do. The best planning often requires extemporaneous modifications when all stations depended upon are not available (which is usually the case) when the real thing comes along. Knowing just what the plan is and how it operates is one of the greatest assets to any local ARES member so detailed explanations are not required.

Each Emergency Coordinator should select one or more of his ARES members to be responsible for conducting liaison with a net of the National Traffic System in order to maintain systematic contact with the nationwide traffic-handling system. Such members should be versatile, because liaison may be by various modes.

Further information and details on ARES organization are contained in the ARRL *Public Service Communications* manual, available free of charge from ARRL Headquarters.

Clear Frequencies During Emergencies. During practice drills and tests, the ARES fights it out with the normal QRM situation in most of the amateur bands. In emergencies, however, FCC in Washington may declare a clear channel in accordance with Section 97.107 of the amateur regulations. Application for required clear channels is made via the FCC Engineer-in-Charge of the area concerned, who will investigate the situation. If he finds that such clear channels are indeed required, he will so recommend to his headquarters, which will usually then declare such required channels as "emergency frequencies" to be used only for this purpose until further notice, or for a designated period of time.

Such declarations are usually announced by ARRL Bulletin via W1AW. Certain amateurs may be designated by FCC as monitors with authority to report stations who refuse to cooperate.

GENERAL CONSIDERATIONS IN EMERGENCIES

Use the ARRL precedence designations of Emergency, Priority, Welfare and Routine in handling traffic during emergencies. Complete definitions are available on ARRL Form CD-3, or CD-218.

Use your receiver more, your transmitter less. The tendency to transmit rather than listen causes excessive QRM.

IN AN EMERGENCY

Monitor your local emergency net frequency.

Make contact with your local EC or RO.

Take immediate steps to follow any prearranged plans.

Stay off the air unless or until you are *sure you can be of assistance.*

In widespread emergencies, monitor W1AW for latest bulletin and news: phone on the hour, RTTY at 15 past the hour, cw on the half hour.

Amateur communication is point-to-point communication, not broadcast. Our purpose is to supply communication with as much secrecy and as little public excitement as possible.

Be sure that all official messages are properly authenticated. Do not originate messages yourself—let officials originate them *and sign them.* Our part in the emergency is to supply the communication—it is up to others to supply its content.

Good advance amateur planning, by ARES groups, ordinarily develops efficient communications through:

a) Designating main stations for key points.

b) Providing operators and relief operators.

c) Reducing interference levels by asking voluntary cooperation in standing by.

Analysis of station frequencies and equipment, from registrations, has an important bearing. Plans may involve: (a) local vhf links (repeaters), (b) low frequency nets and schedules for point-to-point distance work, (c) putting skilled operators on circuits having heavier loads, (d) use of cw or RTTY in record communication, reducing phone band congestion, (e) use of phone for information discussion where secrecy is less important.

Facilities should be pooled for best results with minimum interference, and divided among the different agencies served.

NATIONAL TRAFFIC SYSTEM

NTS is the principal facility for medium and long range traffic. It is organized on the basis of daily operation, in consonance with the operating habits of the average amateur. In emergencies, NTS is geared to go into continuous operation in accordance with the needs and extent of the particular emergency encountered.

The system operates sequentially and according to a flow chart. It consists of nets at four levels and a Transcontinental Corps. The first of nets are called "local" nets. These are usually emergency (ARES or RACES) nets, many of them operating on vhf. While NTS operates every day, 365 days per year, the local nets often operate only once per week, and so are not as regular a facility as are other nets of the system. The next level is the "section" net, one or more in or covering each of the 73 sections of the ARRL Field Organization. At a still higher level is the region net, in some cases covering a call area, in others an arbitrary group of states or Canadian provinces generally in accordance with the wishes of the section nets.

NTS is one system, not two systems divided into cw and phone, or into daytime and evening operation. However, the daytime cycle of NTS is usually by voice while the evening cycle is usually by cw. In the present organizational scheme each cycle has separate managers at regional, area and transcontinental levels.

NTS areas correspond roughly to time zones, except that the Mountain and Pacific Time Zones are combined into a single area, ARRL sections on the eastern and western extremities (Maritime, West Indies, Pacific and Alaska) are attached to the area nearest to them, and no sections are divided between regions or areas.

In a normal sequence, NTS is geared for completion of two cycles per day, one daytime cycle and one evening cycle, with interconnection between the two cycles so that ideally traffic originated on one coast can be delivered on the other coast and a reply received the same day (i.e. within 24 hours or less). In such a sequence, local nets would meet first and send representatives to section nets; then section nets would meet and send representatives to regional nets; following this, regional nets meet and send representatives to area nets. At area level, the mission is to exchange traffic among the regions. Traffic exchange among the areas is accomplished by a Transcontinental Corps (TCC). TCC operators make their inter-area traffic transfers at times and on frequency bands best suited to transfer function, with the object of 24-hour coast-to-coast traffic delivery.

Once the interchange of traffic has been completed at area level, the sequence then reverses itself, from area back to region, thence to section and local levels as feasible. Delivery of traffic is usually effected at section or local level, the latter depending on how often the local net meets and what parts of the section are covered by local nets. Keep in mind that we are talking here about the ideal. The actual operation often requires adoption of alternative expedients, and in an emergency situation the system is geared to extra cycles as required.

THE RADIO AMATEUR CIVIL EMERGENCY SERVICE

In 1976, after a thorough study and review, FCC drastically revised the RACES rules in order to remove much of the governmental and commercial influence and re-establish RACES as an *Amateur Radio* service. During normal (peace) times, RACES shares operation with the regular amateur service in the amateur bands. In the event of national emergency (most specifically, war), it will operate in certain frequency segments of the 80, 40, 20, 15, 10, 6, 2, and 1-1/4 meter bands under certain limitations. Details concerning this and other complications not covered herein are in the RACES rules Subpart F of the Amateur Radio Regulations (Part 97), available in the ARRL *License Manual*. Here is a brief digest of their contents.

1) RACES is for civil defense communications *only*. Civil defense communication is defined rather broadly, however, enabling it to apply to most types of communications we amateurs usually conduct during emergencies.

2) Where any aspect of RACES is not specifically covered in Sup-part F, the regular amateur rules apply.

3) RACES station licenses are issued only to civil defense organizations, and only at local, regional or state levels. (It is assumed that "regional" refers to *intrastate* levels and that RACES station licenses will not be issued to Federal regional organizations.) Amateur stations may not operate in RACES unless registered in a c.d. organization. If this requirement is met, amateur stations need no separate RACES licenses.

4) Operators must have amateur licenses and be signed up in a c.d. organization. Operating privileges coincide with those of the amateur license held. Note that no one not holding an amateur license may function as a RACES *control* operator. This does not rule out use of unlicensed participants provided a duly licensed control operator supervises and takes responsibility.

5) RACES stations and amateur stations operating in RACES are definitely limited as to points of communication by a complicated set of rules which specify whom they *may* communicate with, not whom they may *not* communicate with. What it boils down to is that when in RACES operation, RACES stations and amateur stations signed up with c.d. organizations may communicate only with each other, not with non-RACES amateurs.

6) Tests or drills are limited to a total time of one hour per week. Messages transmitted during such tests and drills must be clearly identified as "drill" or "test" messages in the body of each such message.

If you are interested in participating in this important service, contact your local or state c.d. or civil disaster organization. The above is but a brief resume of the regulations and leaves out many details which can be gleaned from studying Subpart F or the appropriate part of the ARRL *Public Service Communications Manual,* free on request.

VI — ARRL FIELD ORGANIZATION

The United States and Canada are divided into sixteen ARRL Divisions. Every two years the full ARRL members in each of these divisions elect a director and a vice director to represent them on the League's Board of Directors. The Board determines the policies of the League which are carried out by the Headquarters staff. A director's function is principally policymaking at the highest level, but the Board of Directors is all-powerful in the conduct of League affairs.

The sixteen divisions are further broken down into 73 "sections," and the ARRL full members in each section elect a Section Communications Manager. Just as a director seldom concerns himself with operating-administration, except in an overall-policy way, the SCM has no function regarding overall ARRL policy. The SCM as such is not a subordinate of the director. They serve two entirely different, although allied, functions.

The number of geographical division of ARRL sections can change from time to time, but this seldom occurs and the operating field organization remains fairly stable from year to year. Following a breakdown of sections within each division and counties within each split-state section.

ATLANTIC DIVISION: *Delaware; Eastern Pennsylvania* (Adams, Berks, Bradford, Bucks, Carbon, Chester, Columbia, Cumberland, Dauphin, Delaware, Juniata, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Lycoming, Monroe, Montgomery, Montour, Northampton, Northumberland, Perry, Philadelphia, Pike, Schuylkill, Snyder, Sullivan, Susquehanna, Tioga, Union, Wayne, Wyoming, York); *Maryland-D.C.; Southern New Jersey* (Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem); *Western New York* (Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Cortland, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, St. Lawrence, Schoharie, Schuyler, Seneca, Steuben, Tioga, Tompkins, Wayne, Wyoming, Yates); *Western Pennsylvania* (those counties not listed under Eastern Pennsylvania).

CENTRAL DIVISION: *Illinois; Indiana; Wisconsin.*

DAKOTA DIVISION: *Minnesota; North Dakota; South Dakota.*

DELTA DIVISION: *Arkansas; Louisiana; Mississippi; Tennessee.*

GREAT LAKES DIVISION: *Kentucky; Michigan; Ohio.*

HUDSON DIVISION: *Eastern New York* (Albany, Columbia, Dutchess, Greene, Orange, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Sullivan, Ulster, Warren, Washington, Westchester); *N.Y.C.—L.I.* (Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk); *Northern New Jersey* (Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren).

MIDWEST DIVISION: *Iowa; Kansas; Missouri; Nebraska.*

NEW ENGLAND DIVISION: *Connecticut; Maine, Eastern Massachusetts* (Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk); *New Hampshire; Rhode Island; Vermont; Western Massachusetts* (those counties not listed under Eastern Massachusetts).

NORTHWESTERN DIVISION: *Alaska; Idaho; Montana; Oregon; Washington.*

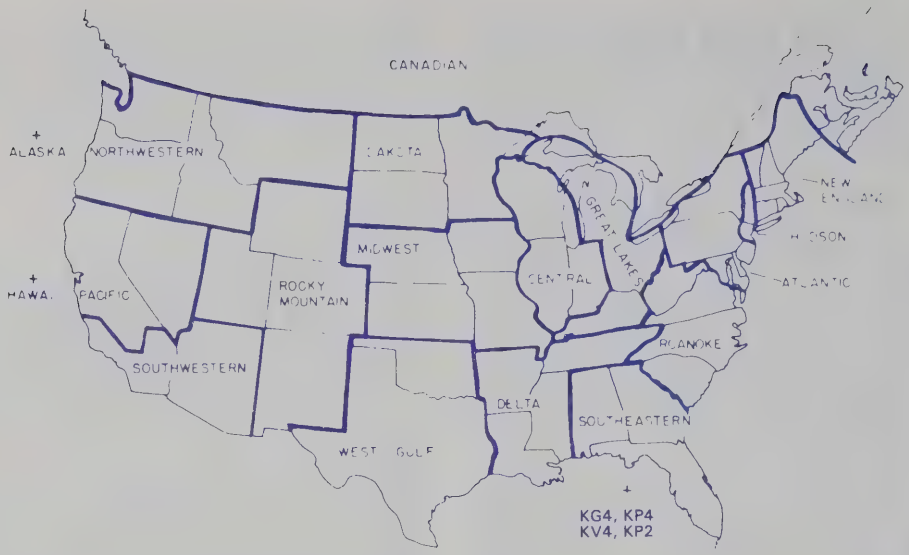
PACIFIC DIVISION: *East Bay* (Alameda, Contra Costa, Lake, Napa, Solano); *Nevada; Pacific* (Hawaii and U.S. possessions in the Pacific); *Sacramento Valley* (Alpine, Butte, Colusa, El Dorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Yolo, Yuba); *San Francisco* (Del Norte, Humboldt, Marin, Mendocino, San Francisco, Sonoma); *San Joaquin Valley* (Amador, Calaveras, Fresno, Kern, Kings, Madera, Mariposa, Merced, Mono, San Joaquin, Stanislaus, Tulare, Tuolumne); *Santa Clara Valley* (Monterey, San Benito, San Mateo, Santa Clara, Santa Cruz).

ROANOKE DIVISON: *North Carolina; South Carolina; Virginia; West Virginia.*

ROCKY MOUNTAIN DIVISION: *Colorado; Utah; New Mexico; Wyoming.*

SOUTHEASTERN DIVISION: *Alabama; Georgia; Northern Florida* (Alachua, Baker, Bay, Bradford, Calhoun, Citrus, Clay, Columbia, Dixie, Duval, Escambia, Flagler, Franklin, Gadsden, Gilchrist, Gulf, Hamilton, Hernando, Holmes, Jackson, Jefferson, Lafayette, Lake, Leon, Levy, Liberty, Madison, Marion, Nassau, Okaloosa, Orange, Pasco, Putnam, Santa Rosa, Seminole, St. Johns, Sumter, Suwanee, Taylor, Union, Volusia, Wakulla, Walton, Washington); *Southern Florida* (those counties not listed under Northern Florida); *West Indies* (Puerto Rico and U.S. possessions in the Caribbean).

SOUTHWESTERN DIVISION: *Arizona; Los Angeles; Orange* (Inyo, Orange, Riverside, San Bernardino); *San Diego* (Imperial, San Diego); *Santa Barbara* (San Luis Obispo, Santa Barbara, Ventura).



WEST GULF DIVISION: *Northern Texas* (Anderson, Andrews, Archer, Armstrong, Bailey, Baylor, Bell, Borden, Bosque, Bowie, Briscoe, Brown, Callahan, Camp, Carson, Cass, Castro, Cherokee, Childress, Clay, Cochran, Coke, Coleman, Collin, Collingsworth, Comanche, Cooke, Coryell, Cottle, Crane, Crosby, Dallam, Dallas, Dawson, Deaf Smith, Delta, Denton, Dickens, Donley, Eastland, Ector, Ellis, Erath, Falls, Fannin, Fisher, Floyd, Foard, Franklin, Freestone, Gaines, Garza, Glasscock, Gray, Grayson, Gregg, Hale, Hall, Hamilton, Hansford, Hardeman, Harrison, Hartley, Haskell, Hemphill, Henderson, Hill, Hockley, Hood, Hopkins, Howard, Hunt, Hutchinson, Irion, Jack, Johnson, Jones, Kaufman, Kent, King, Knox, Lamar, Lamb, Lampasas, Limestone, Lipscomb, Loving, Lubbock, Lynn, McLennan, Marion, Martin, Midland, Mills, Mitchell, Montague, Moore, Morris, Motley, Nacogdoches, Navarro, Nolan, Ochiltree, Oldham, Palo Pinto, Panola, Parker, Parmer, Potter, Rains, Randall, Regan, Red River, Roberts, Rockwall, Runnels, Rusk, Scurry, Shackelford, Shelby, Sherman, Smith, Somervell, Stephens, Sterling, Stonewall, Swisher, Tarrant, Taylor, Terry, Throckmorton, Titus, Tom Green, Upshur, Upton, Van Zandt, Ward, Wheeler, Wichita, Wilbarger, Winkler, Wise, Wood, Yoakum, Young); *Oklahoma; Southern Texas* (those counties not listed under Northern Texas).

CANADIAN DIVISION: *Alberta; British Columbia; Manitoba; Maritime* (Nova Scotia, New Brunswick, Prince Edward Island, Labrador, Newfoundland); *Ontario; Quebec; Saskatchewan.*

SECTION COMMUNICATIONS MANAGER

This is the only elected official in the League's *operating* (i.e., on the air) program. The SCM is the leading official of this program and all ARRL-sponsored operating activities within the section stem from his authority. His duties are manifold and in larger sections quite demanding. Details regarding the election procedures for SCMs are contained in the "Rules and Regulations of the Communications Department," available on request of any ARRL member. Election notices are posted regularly in the "Operating News" section of *QST*. An SCM candidate must have been an ARRL full member for at least two years and the holder of amateur General Class license or higher (Canadian Advanced Amateur Certificate) immediately prior to receipt of petition at headquarters, and if elected must maintain membership throughout the term of office.

The following is a detailed resume of the duties of the SCM:

1. Build and maintain the section organization in the name of ARRL and devise means through Amateur Radio operating of promoting high general interest and *esprit de corps*.

2. Foster the creation and maintenance of section network activities in all bands and modes available, with special attention to emergency preparedness and other activities in the public interest.

3. Render a monthly report or activity summary to the ARRL Communications Manager, to be published in *QST*. Such report contains reports of activities of the section's amateur stations, whether ARRL members or not, and includes club items.

4. Make official individual and station appointments to qualified ARRL members only, and maintain accurate records of such appointments made, endorsed and cancelled, including notification of Headquarters on proper and appropriate forms furnished. The SCM may require any appointment prospect to pass whatever tests appear in his judgment to be needed to demonstrate qualifications; the SCM issues all appointment certificates and endorses them every two years.

5. To provide the SCM with leadership assistance, he may appoint a Section Emergency Coordinator, a Section Traffic Manager and as many Net Managers as there are official section nets. These appointees serve as his assistants in the specialized fields of emergency preparedness and trafic handling.

6. Issue section net certificates to amateurs in ARRL-sponsored or recognized nets at section level. Issue BPL certificates to those members whose traffic count meets the requirements each month.

7. Conduct correspondence, on the air contact and personal contact with amateurs and clubs in the section with the general aim of fostering a high state of activity. Reimbursement is provided for postage, certain stationery expenses and certain travel.

8. Perform whatever paperwork is necessary to keep the section records accurate and up-to-date.

In addition to the above duties, the SCM may also, if he deems advisable, engage in public relations programs and promotions, dissemination of public information, recruitment and training of new amateurs and ARRL members, and dissemination of information to the general public or to clubs, appointees and members within his section. He may also participate in convention and hamfest planning, organization and promotion.

The SCM may appoint an Assistant SCM, if needed, for general section administration assistance; such an appointee will normally exist only in sections with a large population. The SCM serves for a two-year term and may be reelected an unlimited number of times. There is no age minimum.

ARRL LEADERSHIP APPOINTMENTS

It has long been ARRL policy to enhance each group interest in Amateur Radio along the lines of natural interest—by activities and by station and leadership appointments. Public service is served primarily by the latter means, the SCM appointing a Section Emergency Coordinator, Section Traffic Manager, Emergency Coordinators, and Net Managers to serve as his "assistants" in promoting emergency preparedness and traffic-handling activities in the section. Holders of such appointments may wear the League emblem pin with the distinctive deep green background. All leadership appointees must hold full ARRL membership.

SECTION EMERGENCY COORDINATOR

The SEC is, in effect, "assistant SCM for ARES organization." He must hold a General Class license or higher and is appointed by the SCM to take care of all matters pertaining to emergency communication and ARES on a sectionwide basis. His duties include the following:

1. The encouragement of all groups of community amateurs to establish a local emergency organization.

2. Recommendations to the SCM on all section emergency policy and planning, including the development of a section emergency communications plan.

3. Cooperation and coordination with the Section Traffic Manager so that emergency nets and traffic nets in the section present a united public service front.

4. Recommendations of candidates for Emergency Coordinator and District Emergency Coordinator appointments (and cancellations) to the SCM and determination of areas of jurisdiction of each amateur so appointed. Note that the SEC does not make (or cancel) appointments; the SEC simply recommends them to the SCM.

5. Promotion of ARES membership drives, meetings, activities, tests, procedures, etc., at the section level.

6. Collection and consolidation of Emergency Coordinator (or District Emergency Coordinator) monthly reports and submission of monthly progress summaries to ARRL headquarters.

7. Maintenance of contact with other communications services and liaison at the section level with all agencies served in the public interest, particularly in connection with state and local government, civil defense, Red Cross, Salvation Army, and the National Weather Service.

SECTION TRAFFIC MANAGER

The STM is a leadership appointment at the same level as the Section Emergency Coordinator, serving approximately the same kind of purpose, but in a slightly different field. We say slightly because the traffic and emergency fields are closely related and, to a great extent, intertwining. Thus, a traffic appointment at the section leadership level is most appropriate.

In every section, there should be an Amateur, appointed by the SCM, capable of traffic handling organization at the section level — that is, of coordinating the activities of all traffic nets, both National Traffic System-affiliated and independents, so that routings within the section and connections with other nets to effect orderly and efficient traffic flow are maintained. In other words, the STM is the Assistant SCM for traffic handling. There is only one STM appointed for each section. The STM should be a person at home and familiar with traffic handling by all modes, especially phone and cw. If such a person cannot be found, then the primary qualifications should be willingness and ability to devote equal consideration and time to all section traffic matters.

STM qualifications and functions:

1. Establishment, administration and promotion of a traffic-handling program at the section level, mainly but not restricted to NTS nets.

2. Cooperation and coordination with the Section Emergency Coordinator so that traffic nets and emergency nets in the section present a united public service front.

3. Recommendations of candidates for Net Manager to the SCM, and advise on Official Relay Station candidates.

4. Ability and familiarity with proper traffic handling procedures in two or more different modes.

5. Reporting section net activities monthly to ARRL Headquarters.

6. Full ARRL membership and a General Class license or higher required.

DISTRICT EMERGENCY COORDINATOR

In recognition of the advantage of these types of logical groupings in the ARES organization, ARRL has recently officially added the District Emergency Coordinator appointment to the structure. The DEC is generally an amateur experienced in emergency communications who can assist the SEC by taking charge in the area of jurisdiction especially during an emergency.

The DEC shall:

1. Coordinate the training, organization and emergency participation of Emergency Coordinators in the area of jurisdiction.

2. Make local decisions in the absence of the SEC or through coordination with the SEC concerning the allotment of available amateurs and equipment during an emergency.

3. Coordinate the interrelationship between local emergency plans and between communications networks within the area of jurisdiction.

4. Act as backup for local press without an emergency coordinator and assist in maintaining contact with governmental and other agencies in the area of jurisdiction.

5. Provide direction in the routing and handling of emergency communications of either a formal or tactical nature.

6. Recommend EC appointments to the SEC and SCM and advise on OES appointments.

7. Coordinate the reporting and documentation of ARES activities in the area of jurisdiction.

8. Act as a model emergency communicator as evidenced by dedication to purpose, reliability and understanding of emergency communications.

EMERGENCY COORDINATOR

Appointment of an Emergency Coordinator should be made by the SCM, on recommendation of the SEC and DEC, in every community where a qualified amateur of Technician class or higher can be found, since it is on his work and that of the local amateurs working with him that the entire ARES organization is based. While his duties are varied and manifold, they can be generally described as promotion and enhancement of activities of the Amateur Radio Emergency Service for public service at the *local* level.

The EC shall:

1. Coordinate the training, organization and emergency participation of interested amateurs in the area of jurisdiction.

2. Establish an emergency communications plan for the area that will effectively utilize the group to cover the needs for both tactical and formal message traffic requirements.

3. Establish a viable working relationship with governmental and other agencies who might need the service of ARES (e.g. Red Cross, Salvation Army, Rescue Squads, Weather Bureau, Hospitals, Police Department, Fire Department, etc.).

4. Establish local communications networks run on a regular basis and periodically test these networks by drills.

5. Establish an emergency traffic plan utilizing NTS to the extent possible and coordinate liaison with NTS nets.

6. In times of disaster, evaluate the communications needs of the jurisdiction and respond quickly to those needs.

7. Do all that is possible to further the image of Amateur Radio by dedication to purpose, reliability and a thorough understanding of the mission of Amateur Radio.

Every EC, on appointment, receives a copy of the *Emergency Coordinator's Workbook,* containing full details on how to organize and the basic principles of ARES organization, plus many samples and illustrations. Briefly, a newly-appointed EC should undertake the following steps (or review each phase if he is succeeding someone else):

1) A general meeting of local amateurs.

2) Recommend candidates for Official Emergency Station appointment (see **ARRL Station Appointments**).

3) Designate Assistant ECs to serve specialized areas on a Planning Committee.

4) Have a meeting with the committee to discuss initial plans.

5) Contact local "to-be-served" agencies to determine requirements.

6) Draft detailed plans to serve community requirements.

7) Establish training procedures to insure that the plans can be carried out in any emergency.

The EC also has certain routine administrative duties as follows:

a) Maintain full and current information on OES appointees and ARES registrants. Keep the DEC and SEC informed on the former.

b) Issue certificates to assistant ECs (not an SCM appointment) and assign each a specific subleadership role in the local ARES organization.

c) Report the status of the ARES unit to the DEC each month on the form provided (CD-212).

d) Coordinate and cooperate with the DEC.

The area of jurisdiction of each EC is determined by the SCM at the recommendation of the SEC/DEC. It depends on the ARES organizational plan of the section.

The principles to be observed, and ways and means of participating in a strong amateur facility dedicated to public service operating are discussed in detail in the ARRL *Public Service Communications* manual, which is "must" reading for all OES appointees.

NET MANAGER

For coordinating and supervising traffic handling activities in the section, the SCM may appoint one or more Net Managers, usually on recommendation of the Section Traffic Manager. The number of NMs appointed may depend on a section's geographical size, the number of nets operating in the section, or other factors having to do with the way the section is organized. In some cases, there may be only one net manager in charge of the one section net, or one NM for the phone net, one for the cw net. In larger or more traffic-active sections there may be several, including NMs for the vhf net or nets, for the RTTY net, or NTS local nets not controlled by ECs. All ARRL NMs should work under the STM or SCM in a coordinated section traffic plan.

Some nets cover more than one section but operate in NTS at the section level. In this case, the net manager is selected by the net managers or by agreement among the SCMs concerned and the NM appointment conferred on him by his resident SCM.

NMs may conduct any testing of candidates for ORS appointment (see below) that they consider necessary before making appointment recommendations to the STM or SCM. Net Managers also have the function of requiring that all traffic handling in ARRL recognized nets is conducted in proper ARRL form.

ARRL STATION APPOINTMENTS

Amateur licensees who are full ARRL members and hold the required grade of license are invited to contact their SCMs to take on "station" appointments along the lines of their special interests. At the present time, such 2-year appointments are open to amateurs interested in traffic handling, emergency operating, vhf operating, observer-monitoring, and transmitting bulletins to all amateurs. All appointees receive handsome certificates from the SCM and are entitled to wear ARRL membership pins with the distinctive blue background. All SCM appointees are required to submit monthly reports to the SCM in order to hold their appointments, to keep their stations active on the air, to follow standard ARRL operating practices and to take active part in ARRL on-the-air activities to the extent practical.

The monthly report is the criterion of activity. An appointee who misses three consecutive monthly reports is subject to cancellation by the SCM, who cannot know what or how much you are doing if you do not tell him. An appointee whose appointment is cancelled for this or other reasons must earn reinstatement by demonstrating his activity and adherence to the requirements. Reinstatement of cancelled appointments, and indeed judgment of whether or not a candidate meets the requirements, is at the discretion of the SCM.

The detailed qualifications for the five "station" grade appointments are given below. If you are interested, your SCM will be glad to receive your application. Ask him or Headquarters for a Form CD-187, or use the application form printed in the back of this booklet.

OFFICIAL RELAY STATION

This is a traffic-handling appointment that is open to all classes of license. This appointment applies equally to all modes and all parts of the spectrum. It is for traffic-handlers, regardless of how they do it or in what part of the spectrum.

The potential value of the operator who has traffic know-how to his country and community is enhanced by his ability and the readiness of his station to function in the community interest in case of emergency. Traffic awareness and experience are often the signs by which mature amateurs may be distinguished.

Traditionally, there have been considerable differences between procedures for traffic handling by cw, phone, RTTY, ASCII and other modes. Appointment requirements for ORS do not deal with these, but with factors equally applicable to all modes. The appointed ORS do not deal with these, but with factors equally applicable to all modes. The appointed ORS may confine his activities to one mode or one part of the spectrum if he wishes. There is no versatility requirement, although versatility does indeed make it possible for anyone to perform a more complete public service. There is, however, the expectation that the ORS will set the example in traffic handling *however* he does it. To the extent that he is deficient in performing traffic functions by any mode, to that extent he does not meet the qualifications for the appointment. Here are the basic requirements:

1. Full ARRL membership and Novice Class license or higher.

2. Code and/or voice transmission.

3. Transmission quality, by whatever mode, must be of the highest quality, both technically and operationally. For example, cw signals must be pure, chirpless, clickless, code sending must be well spaced and properly formed. Voice transmission must be of proper modulation percentage or deviation, precisely enunciated with minimum distortion. RTTY must be clickless, proper shift, etc.

4. All ORS are expected to follow standard ARRL operating practices (message form, ending signals, abbreviations or prowords, courtesy, etc.).

5. Regular participation in traffic activities, either free-lance or ARRL-sponsored. The latter is encouraged, but not required.

6. Handle all record communications speedily and reliably and set the example in efficient operating procedures. All traffic is relayed or delivered promptly after receipt.

7. Report monthly to the SCM or STM, including a breakdown of traffic handled during the past calendar month.

OFFICIAL EMERGENCY STATION

Amateur operators of Technician Class and above may be appointed OES by their SCMs at the recommendation of their ECs or DECs (if no EC) if they are ARRL members and interested in setting high standards of emergency preparedness and operating. In addition to candidates for this ap-

pointment operating within their own local EC jurisdictional areas, we want to recruit OESs who can set similar examples in "off shore" emergencies, such as those which frequently occur in foreign countries (other than Canada, which is not considered foreign for field organizational purposes). Here are the standard qualifications and functions of this appointment.

1. Possession of full ARRL membership and a Technician Class license or higher.

2. Regular participation in the local ARES, if any, including all drills and tests, emergency nets and, of course, real emergency situations.

3. Ability to operate independent of commercial mains including at least one-band mobile capability.

4. Must be fully acquainted with standard ARRL message form and capable of using it in handling any third-party messages.

5. Report monthly to the SCM.

OFFICIAL VHF STATION

This appointment is open to any licenseed amateur who is a full member of the League. Its basis is vhf experimental on-the-air activity such as repeaters, space communications, moonbounce, propagation, etc. If you are an amateur who is interested in vhf work of any kind you probably can be eligible for OVS appointment. Here are the requirements and functions:

1. Available to any ARRL full member who operates above 50 MHz.

2. Report contacts, observations, on-air experiments, etc., monthly to SCM, on standard form provided. After extracting any data for his report, the SCM passes these reports along to Headquarters where they are noted by the communications manager, the vhf editor and then passed along to the editor of *QST's* vhf column for possible use therein.

3. The OVS appointee is expected to set the example of excellence in all fields of vhf endeavor, including both signal quality and operating ability. Participation may be in vhf repeater activities, satellite or space communications, propagation, contests, or in any or all of these and other vhf activities.

4. Traffic and emergency preparedness activities are no longer considered a part of the function of OVS appointees. Such work can now qualify for appointment as ORS or OES (see above).

OFFICIAL BULLETIN STATION

ARRL bulletins are issued by ARRL Headquarters and transmitted several times daily on a regular schedule over the Headquarters station W1AW. ARRL bulletins of particular importance are also mailed to Official Bulletin Station appointees. OBS appointees have the function of copying these transmissions and retransmitting them for the benefit of amateurs in their areas who may have difficulty receiving them direct from W1AW. This is particularly applicable to vhf transmissions, and amateurs who can copy the transmissions and retransmit them on vhf are much in demand and of maximum usefulness. However, OBS appointments are also conferred on hf stations where the need is apparent. OBS appointees are expected to copy the bulletins on the air and proceed to transmit them on regular schedule—copying direct from W1AW or another OBS.

1. OBS appointees must be full ARRL members and have a Technician license or higher.

2. Retransmission of the official bulletin must be made a minimum of once per week in order to retain appointment.

3. Appointees must adhere to a regular schedule of transmissions agreed upon with the SCM, and notify the SCM when changes are made.

4. Send a monthly activity report to the SCM, indicating transmissions made and/or missed and apparent extent of reception.

Applicants for OBS should submit their qualifications to the SCM with the proposed days, times and frequencies for transmissions of the bulletins. If your other qualifications are in order and the SCM feels that your transmissions will be useful, chances are good that the appointment will be made.

OFFICIAL OBSERVER

The Official Observer program has been sponsored by the League for over 50 years to help amateurs help each other. Official Observer appointees have aided thousands of amateurs to maintain their transmitting equipment and operating procedures in compliance with the regulations. The object of the OO program is to notify amateurs by mail of operating/technical irregularities before they come to the attention of the FCC or DOC (Canada).

The OO performs his function by **listening** rather than transmitting, keeping a watchful ear out for such things as frequency instability, harmonics, hum, key clicks, broad signals, distorted audio, overdeviation, out-of-band operation, etc. The program is neither a vigilante nor a law-enforcement function. The OO completes his task once the notification card is sent. Reimbursement for postage expenses are provided for through the SCM. Requirements follow:

1. Must be an ARRL full member and have been a licensee of Technician Class of higher for at least four years.

2. To qualify for "precise frequency measurement," the Observer must qualify annually in the Frequency Measuring Test held quarterly to a tolerance of 100 Hz. Observers who have not so qualified must report all frequencies as "approximate" when reporting discrepancies.

3. Must report to the SCM each month on CD-23.

4. Maintain regular activity in sending out notices as observed.

Applications for this most serious endeavor are available from your SCM or directly from Headquarters. Once the appointment is made by the SCM, the new appointee will receive a complete set of detailed operating instructions (CD-100) and an initial supply of notification report cards.

Periodically, the OO will receive **The Observation Post,** a publication distributed to all OO appointees giving latest information to assist in daily observations.

The OO program is one of the most important functions of the League. A sincere dedication to helping our brother and sister amateurs is required for appointment. Only the "very best" are sought.

CLUB AND TRAINING

Although not strictly classified as operating, radio clubs are among the most popular of all Amateur Radio activities. The Club and Training (C&T) Department at ARRL has revitalized the club program, providing a dynamic level of support and assistance to clubs and those interested in forming Amateur Radio clubs.

One of the most requested set of C&T materials is the "Club Kit." This kit contains a wealth of information for anyone thinking of starting a new club, for newly formed clubs and the new club officer. Every aspect of club activities, from where to hold meetings to the value of club incorporation is included.

The ARRL has many benefits for clubs which become affiliated with it. Affiliation opens the door to participation in ARRL club competition in contests, first choice of the tremendous number of new training materials, money back on ARRL membership, exhibit materials, member solicitation aids, participation in the new annual club award program, and much more.

Any club with more than half of its voting members as licensed amateurs and more than half of the voting members as ARRL members, is eligible for affiliation. For school and youth clubs, only a single member need be licensed and a League member! The complete details on the affiliation program are contained in the "Club Kit." It costs nothing, and is a tremendous benefit package for the club.

The other phase of the department, training, is making a name for itself assisting instructors of over 2500 classes. The Novice class instructor package contains detailed, minute-by-minute, word-for-word lesson plans for those who are new at the "instructing game." The guide also has ideas for PR for the class, how to keep interest lively, what expenses to expect and more. Also available to the instructor who registers his class with C&T are a set of helpful 35mm Novice training slides (for a $10.00 deposit) and graduation certificates and handouts for his students.

The General class course package includes an instructor's guide that details sample demonstrations, quizzes, discussions, student workbooks, and (for $10.00 deposit) very useful 35mm General Class slides. The Advanced/Extra course package includes a study guide that provides a structured outline of study around which classes may be organized, and extensive referencing to ARRL publications. All instructors who register their classes with C&T will also receive a free subscription to the quarterly "Instructors' Newsletter."

Another part of the training program involves the educational uses of the OSCAR satellites. With the assistance of curriculum materials and general information about the amateur satellites supplied by the ARRL, teachers across the U.S. and Canada are encouraged to hold live demonstrations of the satellite and to apply the principles of its orbit and components to such subject areas as physics, geography, electronics, mathematics and foreign languages. The OSCAR Education Program also provides information to radio amateurs interested in all phases of satellite communications.

Separate packets of educational material and general information on the OSCAR satellites are available free of charge, and audio-visual material is loaned to clubs and individuals holding demonstrations of the satellites.

VII — ABBREVIATIONS AND PREFIXES

Most abbreviations are used for cw work and derive from a number of sources—commercial, military or just traditional amateur. Whether adopted or original, the use of abbreviations in Amateur Radio on cw, RTTY or even on voice, is largely unofficial and unstandard, and a matter of convenience rather than necessity.

"Q" SIGNALS

Quite a number of International Q signals in the R, S and T series are widely used in amateur cw work, and to some extent are also used in voice transmissions—often incorrectly. The meanings of some Q signals change from time to time as dictated by the International Telecommunication Union, but most of them remain the same year after year. Nevertheless, amateurs should strive to keep up to date in the meanings of the Q signals so that when used they are used correctly. Listed below are most of those having a useful amateur meaning. The Q abbreviations take the form of questions only when followed by a question mark.

QRA	What is the name of your station?
QRG	What's my exact frequency?
QRH	Does my frequency vary?
QRK	What is my signal intelligibility? (1-5)
QRL	Are you busy?
QRM	Is my transmission being interfered with?
QRN	Are you troubled by static?
QRO	Shall I increase transmitter power?
QRP	Shall I decrease transmitter power?
QRQ	Shall I send faster?
QRS	Shall I send more slowly?
QRT	Shall I stop sending?

QRU Have you anything for me? (Answer in negative.)
QRV Are you ready?
QRW Shall I inform ... that you are calling him on ...?
QRX When will you call again?
QRZ Who is calling me?
QSA What is my signal strength? (1-5)
QSB Are my signals fading?
QSD Is my keying defective?
QSG Shall I send ... messages at a time?
QSK Can you work breakin?
QSL Can you acknowledge receipt?
QSM Shall I repeat the last message sent?
QSO Can you communicate with ... direct?
QSP Will you relay to ...?
QSV Shall I send a series of V's?
QSW Will you transmit on ...?
QSX Will you listen for ... on ...?
QSY Shall I change frequency?
QSZ Shall I send each word/group more than once? (Answer, send twice or ...)
QTA Shall I cancel message number ...?
QTB Do you agree with my word count? (Answer negative.)
QTC How many messages have you to send?
QTH What is your location?
QTR What is the correct time?
QTX Will you keep your station open for further communication with me?
QUA Have you news of ...?

SIGNAL REPORTING

A standard system of reporting signal readability, strength and tone is recommended by ARRL and is used widely in amateur circles. This system has three scales, 1—5 for readability and 1—9 each for strength and tone. The tone report, of course, does not apply to voice signals. On cw, a report of RST 367 would be interpreted as "Your signals are readable with considerable difficulty, good strength, trace of modulation." On voice, a signal of the same characteristics would be reported as "Readability three, strength six." There is no report higher than S9, so a report of S9 + simply indicates an outstandingly strong signal, as do such hybrids as "thirty dB over S9."

An alternative to the RST reporting system is use of the standard signals QRK and QSA for intelligibility and strength respectively. See the Q signal list above for appropriate definitions.

Special abbreviation adopted by ARRL

QST General call preceding a message addressed to all amateurs and ARRL members. This is in effect "CQ ARRL."

THE R-S-T SYSTEM

READABILITY

1—Unreadable.
2—Barely readable, occasional words distinguishable.
3—Readable with considerable difficulty.
4—Readable with practically no difficulty.
5—Perfectly readable.

SIGNAL STRENGTH

1—Faint signals barely perceptible.
2—Very weak signals.
3—Weak signals.
4—Fair signals.
5—Fairly good signals.
6—Good signals.
7—Moderately strong signals.
8—Strong signals.
9—Extremely strong signals.

TONE

1—Sixty-cycle a.c. or less, very rough and broad.
2—Very rough a.c., very harsh and broad.
3—Rough a.c. tone, rectified but not filtered.
4—Rough note, some trace of filtering.
5—Filtered rectified a.c. but strongly ripple-modulated.
6—Filtered tone, definite trace of ripple modulation.
7—Near pure tone, trace of ripple modulation.
8—Near perfect tone, slight trace of modulation.
9—Perfect tone, no trace of ripple or modulation of any kind.

The "tone" report refers only to the purity of the signal, and has no connection with its stability or freedom from clicks or chirps. If the signal has the characteristic steadiness of crystal control, add X to the report (e.g., RST 469X). If it has a chirp or "tail" (either on "make" or "break"), add C (e.g., 469C). If it has clicks or noticeable other keying transients, add K (e.g., 469K). Of course a signal could have both chirps and clicks, in which case both C and K could be used (e.g., RST 469CK).

ARRL COMMUNICATIONS PROCEDURES

VOICE	*CODE*	*SITUATION*
go ahead	**K**	used after calling CQ, or at the end of a transmission, to indicate any station is invited to transmit.
over	**$\overline{\text{AR}}$**	used after a call to a specific station, before the contact has been established.
---	**$\overline{\text{KN}}$**	used at the end of any transmission when only the specific station contacted is invited to answer.
standby or wait	**$\overline{\text{AS}}$**	a temporary interruption of the contact.
roger	**R**	indicates a transmission has been received correctly and in full.
clear	**$\overline{\text{SK}}$**	end of contact. $\overline{\text{SK}}$ is sent before the final identification.
leaving the air or closing station	**CL**	indicates that a station is going off the air and will not listen for or answer any further calls. CL is sent after the final identification.

ABBREVIATIONS FOR CW WORK

The purpose of using abbreviations is to reduce the amount of time required to transmit intelligence. However, many cw amateur abbreviations have been carried over into voice work and have become part of the "lingo." In general, it is considered good practice to abbreviate on cw, poor practice to use cw abbreviations on phone. The list below covers only those abbreviations most used.

AA	All after
AB	All before
ABT	About
ADR	Address
AGN	Again
ASCII	American Standard Code for Information Interchange
BCI	Broadcast Interference
BCNU	Be seeing you
BK	Break; break me; break in
BN	All between; been
BUG	Semi-automatic key
B4	Before
C	Yes
CFM	Confirm; I confirm
CK	Check
CL	I am closing my station; call
CLD-CLG	Called; calling
CQ	Calling any station
CUL	See you later
CW	Continuous wave (i.e., radiotelegraph)
DLVD	Delivered
DR	Dear
DX	Distance
ES	And
FB	Fine business; excellent
FREQ	Frequency
GA	Go ahead, good afternoon
GB	Good-bye
GBA	Give better address
GE	Good evening
GG	Going
GM	Good morning
GN	Good night
GND	Ground
HI	The telegraphic laugh; high
HR	Here; hear
HV	Have
HW	How
ITU	International Telecommunications Union
LID	A poor operator
MSG	Message; prefix to radiogram
N	No
NBVM	Narrow band voice modulation
NCS	Net Control Station
ND	Nothing doing
NIL	Nothing; I have nothing for you
NR	Number
NW	Now; I resume transmission
OB	Old boy
OM	Old man

OP-OPR	Operator
OT	Old timer; old top
PBL	Preamble
PSE	Please
R	Received solid
RCVR	Receiver
RECD-RCVD	Received
RFI	Radio frequency interference
RPT	Repeat; I repeat
RTTY	Radioteletype
SASE	Self-addressed, stamped envelope
SIG	Signature, signal
SKED	Schedule
SRI	Sorry
SSB	Single sideband
SVC	Service; prefix to service message
SWL	Short wave listener
TFC	Traffic
TMW	Tomorrow
TNX-TKS	Thanks
TT	That
TU	Thank You
TVI	Television interference
UR-URS	Your; you're; yours
VFO	Variable frequency oscillator
VY	Very
WA	Word after
WB	Word before
WRD	Word; words
WKD-WKG	Worked; working
WL	Will
WPM	Words per minute
WX	Weather
XMTR	Transmitter
XTAL	Crystal
XYL(YF)	Wife
YL	Young lady
Z	Universal Coordinated Time
ZB	Zero beat
73	Best regards
88	Love and kisses

ARRL TERMS

ARES	Amateur Radio Emergency Service
BPL	Brass Pounders League
CAC	Contest Advisory Committee
CD	Communications Department
CP	Code Proficiency
DEC	District Emergency Coordinator
DXAC	DX Advisory Committee
DXCC	DX Century Club
5BDXCC	Five-Band DXCC
EC	Emergency Coordinator
ECAC	Emergency Communications Advisory Committee
FD	Field Day
IARU	International Amateur Radio Union
IW	Intruder Watch
LO	League Official
NM	Net Manager
NTS	National Traffic System
OBS	Official Bulletin Station
OES	Official Emergency Station
OO	Official Observer
OTS	Official Traffic Station
OVS	Official VHF Station
PRA	Public Relations Assistant
PRAC	Public Relations Advisory Committee
PSHR	Public Service Honor Roll
RCC	Rag Chewers' Club
SCM	Section Communications Manager
SEC	Section Emergency Coordinator
SS	Sweepstakes
STM	Section Traffic Manager
TA	Technical Advisor
TCC	Transcontinental Corps
VRAC	VHF Repeater Advisory Committee
VUAC	VHF-UHF Advisory Committee
WAC	Worked All Continents
5BWAC	Five-Band WAC
6BWAC	Six-Band WAC
WAS	Worked All States
5BWAS	Five-Band WAS

OPERATING AIDS

Number Radiograms	CD-3
W1AW Schedule	CD-5
Qualifying Run Schedule	CD-9
Net Directory	CD-50
Code-Practice Stations	CD-139
DX Operating Code	CD-215
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Time/RST/Phonetics	CD-220
WAS Map	CD-222
Emergency Reference Information	CD-255
160-Meter Allocations	S-15A
Public Service Communications Manual	CD-235

Operating an Amateur Radio Station booklet

PREFIXES

Prefixes assigned to different countries help in identifying the nationality of all calls heard on the air. Nations with amateur stations select some letter or letters from their assignment to use as a prefix to amateur calls.

The ARRL *Handbook* and Logbook contain a listing of the alphabetical blocks assigned by the international conference to each nation from which *all* classes of stations are assigned prefixes. Refer to this list when necessary to identify the nationality of foreign and non-amateur stations.

The following prefixes are assigned to amateurs of the United States and Possessions or are under U.S. administration.

A,N,W,K	U.S.
KB,KH1	Baker, Howland & American Phoenix Islands
KC4	Antarctic
KC4,KP1	Navassa Island
KC6	Eastern Caroline Islands/Western Caroline Islands
KG4	Guantanamo Bay
KG6,KH2	Guam
KG6R,-S,T,KHØ	Mariana Islands
KH6	Hawaiian Islands
KH7	Kure Island
KJ,KH3	Johnston Island
KL7	Alaska
KM,KH4	Midway Islands
KP4	Puerto Rico
KP4	Desecheo
KP6,KH6K	Kingman Reef
KP6,KH5	Palmyra Group, Jarvis Islands
KS4,KP3	Roncador Cay, Serrana Bank
KS6,KH8	American Samoa
KV4,KP2	Virgin Islands
KW6,KH9	Wake Group
KX6	Marshall Islands

VIII — MISCELLANY

SAFETY

Definitely a part of proper operation of an amateur station is the observation of certain safety precautions. While the best and most dependable safety device in an amateur station is the operator who has developed certain safety habits (as opposed to one who is in the habit, for example, of pulling arcs off transmitter tank coils with his fingers) in his daily operation, a number of mechanical and design considerations can be extremely helpful in protecting the unaware or careless operator. Insurance company rules more often concern themselves with the latter than the former, and some require inspection before approval of insurance. A "rider" on your homeowner's policy is a good idea in any case if your amateur gear is not covered. The extra cost is minimal.

Lightning protection: All antennas should be provided with grounding devices to prevent buildup of charges and consequent arcs through inflammable material—not to mention protection of equipment. A grounding switch is suitable, but an arrestor which permits an enclosed discharge is even better. Conductors should be as large as practicable. While few precautions will eliminate the effect of a direct hit, the larger the grounding conductors the less damage will be caused. The best ground is a cold water pipe, preferably copper or brass. Other permissible grounds are metal frames of buildings, buried metal or rods driven into ground, preferably marshy. Avoid hot water pipes (poor conductors), or gas (explosive!) pipes.

Speaking of grounding, it is good practice to run a grounding line all through your shack (e.g., along the baseboard) with leads to ground the chassis or enclosures of all your equipment. Prevents shock hazards, especially in basement shacks, and provides good return paths in all your circuitry.

Personal habits: Get into the habit of being sure power switches are *off* before putting your hands into equipment. If possible, keep one hand behind you, or in your pocket. Keep your feet off "ground," especially when the floor is actual ground (e.g., concrete in basement), by wearing rubber soled shoes or propping feet in the rung of a chair or stool while working on equipment. Before you start working on any equipment whether power is on or off, stop and *think!!!* Make a mental check list: Is power off? Are condensers discharged? Is everything properly grounded? Do I know what I'm doing? Don't work on "live" equipment when you are tired, sleepy, emotionally upset or have

something else on your mind. Some very experienced amateurs and electronics experts are now pushing up daisies simply because they *did not think.*

The "buddy" system is highly recommended when working around high voltage. Always be sure to have someone standing by at the main power switch in case something goes wrong. It could save your life.

Write for your copy of the ARRL Safety Code (CT-9).

W1AW

ARRL operates a Headquarters station using W1AW, the original call of its founding father, Hiram Percy Maxim; thus, it is often known as the Maxim Memorial Station. Many services are performed for the operating amateur over W1AW every day, including bulletins of information and latest news, code practice at speeds from 5 through 35 wpm, and certificate-qualifying runs, frequency measuring transmissions, etc. The complete W1AW operating schedule appears in April and October *QST,* and is also available on request from Headquarters with an s.a.s.e. Ask for CD-5.

TIME CONVERSION TO UTC

EST	UTC	CST	MST	UTC	PST
1900	0000*	1800	1700	0000*	1600
2000	0100	1900	1800	0100	1700
2100	0200	2000	1900	0200	1800
2200	0300	2100	2000	0300	1900
2300	0400	2200	2100	0400	2000
0000*	0500	2300	2200	0500	2100
0100	0600	0000*	2300	0600	2200
0200	0700	0100	0000*	0700	2300
0300	0800	0200	0100	0800	0000*
0400	0900	0300	0200	0900	0100
0500	1000	0400	0300	1000	0200
0600	1100	0500	0400	1100	0300
0700	1200	0600	0500	1200	0400
0800	1300	0700	0600	1300	0500
0900	1400	0800	0700	1400	0600
1000	1500	0900	0800	1500	0700
1100	1600	1000	0900	1600	0800
1200	1700	1100	1000	1700	0900
1300	1800	1200	1100	1800	1000
1400	1900	1300	1200	1900	1100
1500	2000	1400	1300	2000	1200
1600	2100	1500	1400	2100	1300
1700	2200	1600	1500	2200	1400
1800	2300	1700	1600	2300	1500

Universal Coordinated Time (UTC) is the time at the zero or reference meridian. Time changes one hour with each change of 15° in longitude. EST, CST, MST and PST are 5, 6, 7 and 8 hours "earlier" than the time at the reference (0°) meridian. They correspond to 75th, 90th, 105th and 120th meridians.

* or 2400. (2400 is associated with the date of the day ending 0000 with the day just starting.)

THE AMERICAN RADIO RELAY LEAGUE, INC.

ADMINISTRATIVE HEADQUARTERS NEWINGTON, CONNECTICUT, U S A 06111

TO SCM IN THE ..... SECTION OF ARRL. (Addresses on page 8, *QST*).

I feel that I can qualify and wish to apply for the following ARRL station appointment(s):

☐ ORS ☐ OES ☐ OVS ☐ OBS ☐ OO

Full name _____ Call _____

The following address should be the same as your ARRL/QST mailing address.

Number and Street _____

City, State/Province, ZIP/Postal Code _____

ARRL membership expiration date _____ Current age _____ Home Telephone _____

Class of present FCC/DOC license _____ Date of FIRST license _____

BANDS WORKED AND EQUIPMENT USED IN MY PRESENT STATION
(use additional sheets, as necessary)

BAND	TRANSMITTER	RECEIVER	ANTENNAS
MHz			
MHz			
MHz			
MHz			
MHz			

Current code speed _____ wpm Net participation _____

Modes used _____ Experimental work on _____

Measuring equipment _____

Achievements and certificates _____

Current appointments _____ I'm a member of ____ ARES ____ NTS ____ MARS ____ RACES.

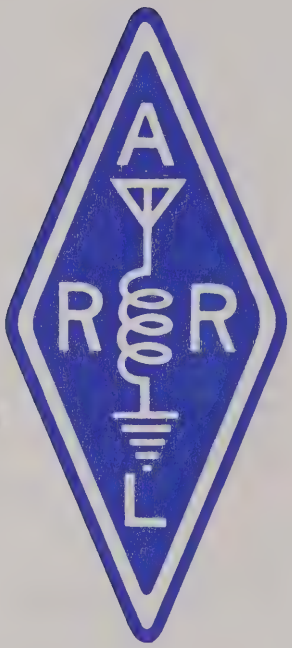
OFFICIAL BULLETIN STATION SCHEDULE

Day	Frequency	Mode	Time

Day	Frequency	Mode	Time

I understand that my appointment requires continuing activity, regular reports and maintenance of my ARRL membership as prequisite to endorsement, and that it may be suspended or cancelled at the discretion of the SCM for violation of any of the bases for appointment.

DATE _____ SIGNATURE _____ CALL _____



"OF BY and FOR the Radio Amateur"

W6BHZ

AMATEUR MESSAGE FORM

Every message originated and handled should contain the following component parts in the order given.

I PREAMBLE
- *a.* Number (begin with 1 each month or year)
- *b.* Precedence (R, W, P or EMERGENCY)
- *c.* Handling Instructions (optional, see text)
- *d.* Station of Origin (first amateur handler)
- *e.* Check (number of words/groups in text only)
- *f.* Place of Origin (not necessarily location of station of origin)
- *g.* Time Filed (optional with originating station)
- *h.* Date (must agree with date of time filed)

II ADDRESS (as complete as possible, include zip code and telephone number)

III TEXT (limit to 25 words or less, if possible)

IV SIGNATURE

CW MESSAGE EXAMPLE

I NR 1 R HXG W1AW 8 NEWINGTON CONN 1830Z July 1
a b c d e f g h

II DONALD R SMITH $\overline{AA}$
164 EAST SIXTH AVE $\overline{AA}$
NORTH RIVER CITY MO 00789 $\overline{AA}$
733-3968 $\overline{BT}$

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE $\overline{BT}$

IV DIANA $\overline{AR}$

CW: Note that X, when used in the text as punctuation, counts as a word. The prosign $\overline{AA}$ separates the parts of the address, $\overline{BT}$ separates the address from the text and the text from the signature. $\overline{AR}$ marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate line.

RTTY: Same as cw procedure above, except (1) use extra space between parts of address, instead of $\overline{AA}$; (2) omit cw procedure sign $\overline{BT}$ to separate text from address and signature, using line spaces instead; (3) add a CFM line under the signature, consisting of all names, numerals and unusual words in the message in the order transmitted.

PHONE: In general, use *prowords* in place of procedural signals or *prosigns*. The above message on phone would go something like this: *"Message Follows* number one, routine HX Golf, W1AW, eight, Newington, Connecticut, one eight thuhree zero zulu, July one, Donald *Initial* R Smith, *Figures* one six fower, East Sixth Avenue, North River City, Missouri zero zero seven eight nine, *Telephone* sev-ven thuhree thuhree, thuhree niyen six eight. *Break* Happy Birthday X-ray see you soon X-ray love *Break* Diana, *End of Message, Over."* Speak in measured tones, emphasizing *every* syllable. Spell out phonetically all difficult or unusual words, but do *not* spell out common ones.

PRECEDENCES

The precedence will follow the message number. For example, on cw 207R or 207 EMERGENCY. On phone, "Two Zero Seven, Routine (or Emergency)."

EMERGENCY — Any message having life and death urgency to any person or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be *very rare*. On cw, this designation will *always* be spelled out. When in doubt, do *not* use it.

PRIORITY — Important messages having a specific time limit. Official messages not covered in the Emergency category. Press dispatches and other emergency-related traffic not of the utmost urgency. Notification of death or injury in a disaster area, personal or official. Use the abbreviation **P** on cw.

WELFARE — A message that is either a) an inquiry as to the health and welfare of an individual in the disaster area or b) an advisory or reply from the disaster area that indicates all is well should carry this precedence, which is abbreviated **W** on cw. These messages are handled *after* Emergency and Priority traffic but before Routine.

ROUTINE — Most traffic normal times will bear this designation. In disaster situations, traffic labeled Routine (**R** on cw) should be handled *last*, or not at all when circuits are busy with Emergency, Priority or Welfare traffic.

Handling Instructions

HXA — (Followed by number.) Collect landline delivery authorized by addressee within..... miles. (If no number, authorization is unlimited.)
HXB — (Followed by number.) Cancel message if not delivered within ....hours of filing time; service originating station.
HXC — Report date and time of delivery (TOD) to originating station.
HXD — Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.
HXE — Delivering station get reply from addressee, originate message back.
HXF — (Followed by number.) Hold delivery until..... (date).
HXG — Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.

This prosign (when used) will be inserted in the message preamble before the station of origin, thus(NR 207 R HXA50 W1AW 12 (etc.). If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated, thus: NR 207 R HXAC W1AW (etc.), but: NR 207 R HXA50 HXC W1AW (etc.); On phone, use phonetics for the letter or letters following the HX, to insure accuracy.

CD 218 4/80 ARRL, 225 Main St., Newington, CT 06111

ARRL QN SIGNALS FOR CW NET USE

QNA*	Answer in prearranged order.
QNB*	Act as relay Between ..... and .....
QNC	All net stations Copy. I have a message for all net stations.
QND*	Net is Directed (controlled by net control station).
QNE*	Entire net stand by.
QNF	Net is Free (not controlled).
QNG	Take over as net control station.
QNH	Your net frequency is High.
QNI	Net stations report In.* I am reporting into the net. (Follow with a list or traffic or QRU).
QNJ	Can you copy me? Can you copy .....?
QNK*	Transmit message for ..... to .....
QNL	Your net frequency is Low.
QNM*	Your are QRMing the net. Stand by.
QNN	Net control station is ..... What station has net control?
QNO	Station is leaving the net.
QNP	Unable to copy you. Unable to copy .....
QNQ*	Move frequency to ..... and wait for .... to finish handling traffic. Then send him traffic for .. ...
QNR*	Answer ..... and Receive traffic.
QNS	Following Stations are in the net.* (Follow with list.) Request list of stations in the net.
QNT	I request permission to leave the net for ... minutes.
QNU*	The net has traffic for you. Stand by.
QNV*	Establish contact with ..... on this frequency. If successful, move to ..... and send him traffic for .....
QNW	How do I route messages for .....?
QNX	You are excused from the net.* Request to be excused from the net.
QNY*	Shift to another frequency (or to .....kHz) to clear traffic with ... ...
QNZ	Zero beat your signal with mine.

***For use only by the Net Control Station.**

Notes on Use of QN Signals

The QN signals listed above are special ARRL signals for use in amateur cw nets *only*. They are not for use in casual amateur conversation. Other meanings that may be used in other services do not apply. Do not use QN signals on phone nets. *Say it with words.* QN signals need not be followed by a question mark, even though the meaning may be interrogatory.

INTERNATIONAL Q SIGNALS

A Q signal followed by a ? asks a question. A Q signal without the ? answers the question affirmatively, unless otherwise indicated.

QRA	What is the name of your station?
QRG	What's my exact frequency?
QRH	Does my frequency vary?
QRI	How is my tone? (1-3)
QRK	What is my signal intelligibility? (1-5)
QRL	Are you busy?
QRM	Is my transmission being interfered with?
QRN	Are you troubled by static?
QRO	Shall I increase transmitter power?
QRP	Shall I decrease transmitter power?
QRQ	Shall I send faster?
QRS	Shall I send slower?
QRT	Shall I stop sending?
QRU	Have you anything for me? (Answer in negative).
QRV	Are you ready?
QRW	Shall I tell .....you're calling him?
QRX	When will you call again?
QRZ	Who is calling me?
QSA	What is my signal strength? (1-5)
QSB	Are my signals fading?
QSD	Are my signals mutilated?
QSG	Shall I send .....messages at a time?
QSK	Can you work breakin?
QSL	Can you acknowledge receipt?
QSM	Shall I repeat the last message sent?
QSO	Can you communicate with .....direct?
QSP	Will you relay to .....?
QSV	Shall I send a series of V's?
QSW	Will you transmit on .....?
QSX	Will you listen for .....on .....?
QSY	Shall I change frequency?
QSZ	Shall I send each word/group more than once? (Answer, send twice or .....)
QTA	Shall I cancel number .....?
QTB	Do you agree with my word count? (Answer negative).
QTC	How many messages have you to send?
QTH	What is your location?
QTR	What is your time?
QTV	Shall I stand guard for you .....?
QTX	Will you keep your station open for further communication with me?
QUA	Have you news of .....?

ABBREVIATIONS, PROSIGNS, PROWORDS

CW	PHONE (meaning or purpose, exception obvious)
AA	(Separation between parts of address or signature.)
AA	All after (use to get fills).
AB	All before (used to get fills).
ADEE	Addressee (name of person to whom message addressed).
ADR	Address (second part of message).
AR	End of message (end of record copy).
ARL	(Used with "check," indicates use of ARRL numbered message in text.)
AS	Stand by; wait.
B	More (another message to follow).
BK	Break; break me; break-in (interrupt transmission on cw. Quick check on phone).
BT	Separation (break) between address and text; between text and signature.
C	Correct; yes
CFM	Confirm. (Check me on this.)
CK	Check
DE	From; this is (preceding identification).
HH	(Error in sending. Transmission continues with last word correctly sent.)
HX	(Handling instructions. Optional part of preamble.)
....	Initial(s). Single letter(s) to follow.
IMI	Repeat; I say again. (Difficult or unusual words or groups.)
K	Go ahead; over; reply expected. (Invitation to transmit.)
N	Negative, incorrect; no more. (No more messages to follow.)
NR	Number. (Message follow.)
PBL	Preamble (first part of message).
....	Read back. (Repeat as received.)
R	Roger; point. (Received; decimal point.)
SIG	Signed; signature (last part of message).
SK	Out; clear (end of communication, no reply expected).
TU	Thank you.
WA	Word after (used to get fills).
WB	Word before (used to get fills).
....	Speak slower.
....	Speak faster.

-over-

Printed in U.S.A.

ARRL ENDING SIGNALS

Meaning	*Phone*	*C W*	*Use*
End of transmission	Over	$\overline{AR}$	After call to a specific station, before contact has been established. Examples: Phone — W6ABC from W9LMN, over. C W — W6ABC DE W9LMN $\overline{AR}$
End of formal message	End of message	$\overline{AR}$	After transmission of a radiogram, following the signature.
Invitation to transmit (any station)	Go (ahead)	K	After CQ and at the end of a transmission during QSO when there is no objection to another station breaking in.
Invitation to transmit (specific station, *only*)	... only, Go	$\overline{KN}$	At the end of any transmission when only the specific station called or being contacted is invited to answer.
End of contact	Clear	$\overline{SK}$	At the end of a QSO. On c w, $\overline{SK}$ W8LMN DE W5BCD. On phone, W8LMN this is W5BCD clear.
Closing station	Clear and leaving the air	CL	When going off the air to indicate no calls will be listened for or answered. On phone, W7HIJ this is W2JKL, clear and leaving the air. On c w, W7HIJ DE W2JKL CL

CD-220 (6–79)

The American Radio Relay League, Inc.
225 Main Street
Newington, Connecticut 06111

IN AN EMERGENCY

Monitor your local emergency net frequency.
Make contact with your local EC or RO.
Take immediate steps to follow any prearranged plans.
Stay off the air unless or until you are *sure* you can be of assistance.
In widespread emergencies, monitor W1AW for latest bulletins and news.

TIME CONVERSION CHART

UTC	EDT/AST	CDT/EST	MDT/CST	PDT/MST	PST
0000*	2000	1900	1800	1700	1600
0100	2100	2000	1900	1800	1700
0200	2200	2100	2000	1900	1800
0300	2300	2200	2100	2000	1900
0400	0000*	2300	2200	2100	2000
0500	0100	0000*	2300	2200	2100
0600	0200	0100	0000*	2300	2200
0700	0300	0200	0100	0000*	2300
0800	0400	0300	0200	0100	0000*
0900	0500	0400	0300	0200	0100
1000	0600	0500	0400	0300	0200
1100	0700	0600	0500	0400	0300
1200	0800	0700	0600	0500	0400
1300	0900	0800	0700	0600	0500
1400	1000	0900	0800	0700	0600
1500	1100	1000	0900	0800	0700
1600	1200	1100	1000	0900	0800
1700	1300	1200	1100	1000	0900
1800	1400	1300	1200	1100	1000
1900	1500	1400	1300	1200	1100
2000	1600	1500	1400	1300	1200
2100	1700	1600	1500	1400	1300
2200	1800	1700	1600	1500	1400
2300	1900	1800	1700	1600	1500
2400*	2000	1900	1800	1700	1600

Universal Coordinated Time (UTC) is the time at the zero or reference meridian. Time changes one hour with each change of 15° in longitude. The five time zones in the U.S. proper and Canada roughly follow these lines.

*0000 and 2400 are interchangeable. (2400 is associated with the date of the day ending, 0000 with the day just starting.

THE AMERICAN RADIO RELAY LEAGUE, INC.
Newington, Conn.

ITU Phonetic Alphabet

Word list adopted by the
International Telecommunication Union

A	ALFA
B	BRAVO
C	CHARLIE
D	DELTA
E	ECHO
F	FOXTROT
G	GOLF
H	HOTEL
I	INDIA
J	JULIETT
K	KILO
L	LIMA
M	MIKE
N	NOVEMBER
O	OSCAR
P	PAPA
Q	QUEBEC
R	ROMEO
S	SIERRA
T	TANGO
U	UNIFORM
V	VICTOR
W	WHISKEY
X	X-RAY
Y	YANKEE
Z	ZULU

THE R-S-T SYSTEM

READABILITY

1 - Unreadable.
2 — Barely readable, occasional words distinguishable.
3 — Readable with considerable difficulty.
4 - Readable with practically no difficulty.
5 - - Perfectly readable.

SIGNAL STRENGTH

1 - Faint signals, barely perceptible.
2 — Very weak signals.
3 — Weak signals.
4 — Fair signals.
5 — Fairly good signals.
6 — Good signals.
7 — Moderately strong signals.
8 — Strong signals.
9 — Extremely strong signals.

TONE

1 — Sixty cycle a.c. or less, very rough and broad.
2 — Very rough a.c. very harsh and broad.
3 - Rough a.c. tone, rectified but not filtered.
4 — Rough note, some trace of filtering.
5 — Filtered rectified a.c. but strongly ripple-modulated.
6 — Filtered tone, definite trace of ripple modulation.
7 - Near pure tone, trace of ripple modulation.
8 - Near perfect tone, slight trace of modulation.
9 — Perfect tone, no trace of ripple or modulation of any kind.

If the signal has the characteristic steadiness of crystal control, add the letter X to the RST report. If there is a chirp, the letter C may be added to so indicate. Similarly for a click, add K. The above reporting system is used on both c w and voice, leaving out the "tone" report on voice. Turn card over for examples.

W6BHZ

This handy operating aid is actually five aids in one. It can be posted at your operating position, reverse side out, or can be separated into each of its five sections and posted separately or kept near your log. This is another service of ARRL to the amateur operating fraternity.

THE AMERICAN RADIO RELAY LEAGUE, INC.
NEWINGTON, CT 06111

To All Radio Amateurs:

The list of "ending signals" on the reverse of this card has been arrived at after careful consideration of common and traditional usuage versus need and common sense. This is the use *recommended* by ARRL, of the various ending signals given.

Whether you operate phone or cw (RTTY can use the cw abbreviations) there are times when, upon standing by, you will find it desirable to indicate to anyone listening, who might want to "break in," just what the status is of the transmission he has just heard. Modern voice communication is "VOX" type and often requires no "ending signals," but voice equivalents of cw ending signals are included for convenience. Please help us popularize them.

American Radio Relay League, Inc.

THE AMERICAN RADIO RELAY LEAGUE, INC.
Newington, Connecticut

To: All Radio Amateurs:

Signal reporting is a courtesy, not an FCC requirement. It is such a common courtesy that every amateur has a space for it in his log and on his QSL card. It is the information most sought in practically any QSO.

The system outlined on the reverse of this card has achieved universal acceptance among c.w. operators, and is being more and more widely used by voice operators.

Be honest! If there is something wrong with the signal of the other fellow, tell him so, because he wants to know, just as you want to know if there is something wrong with yours. Make your reports worthwhile, honest and informative. Use the definitions!

Examples:

By cw: RST 359; RST 569X; RST 489C; RST 579K.

By voice: I am receiving you Readability . . . (1-5), Strength . . . (1-9).

Good Phone Operating

1. **Listen much . . . with care.** Avoid distractions in your operating room. Tune the band well after each call.
2. **Time your calls; monitor your own frequency.** Call only when a station is free.
3. **Make short calls, with breaks to listen.** Speak clearly, at a steady, modest rate. Three short calls are better than one long one.
4. **Use Vox or push-to-talk technique . . . speak near the mike.** Watch the modulation indicator. Keep local background noise at a minimum
5. **Make notes. Avoid missing points for comment.** Jot down topics to avoid repeats.
6. **Talk in connected thoughts and phrases.** Notes will help avoid mixing up subjects. Vox and push-to-talk techniques will help brother amateurs from calling you a monologuist.
7. **Speak naturally.** QSOs need not be cut and dried. Make them interesting. Avoid exhibitionism. Use proper operating form to promote efficiency in communication and add respect and prestige for your station.

To: All Radio Amateurs.

A phonetic alphabet or special word list is recommended to use in identifying station calls or difficult words as necessary.

The list helps to avoid facetious word combinations. This gives it greatest acceptability to all amateurs.

Use of a standard list is recommended by ARRL. Haphazard selection of words often results in confusion. A degree of uniformity in use of phonetic words reflects favorably on your individual operating, and on the whole amateur service.

THE AMERICAN RADIO RELAY LEAGUE, INC.
Newington, Connecticut

Some Facts about Time Conversion

The chart on the other side has been arranged to show time zones used by most amateurs in the North American Continent and Universal Coordinated Time, used universally as a standard. The advantage of UTC is that it is the universally understood reference throughout the world. ARRL recommends that all amateur logging be done in UTC.

All times shown are in 24-hour time for convenience. To convert to 12-hour time: for times between 0000 and 0059, change the first two ciphers to 12, insert a colon and add a.m.; for times between 0100 and 1159, insert a colon and add a.m.; for times between 1200 and 1259, insert a colon and add p.m.; for times between 1300 and 2400, subtract 12, insert a colon and add p.m.

Time zone letters may be used to identify the kind of time being used. For example, UTC is designated by the letter Z, EDT/AST by the letter Q, CDT/EST by R, MDT/CST by S, PDT/MST by T, PST by U; thus, 1200R would indicate noon in the CDT/EST zone, which would convert to 1700 UTC or 1700Z.

In converting from one time to another, be sure the day or date corresponds to the new time. That is, 2100R (EST) on Jan. 1 would be 0200Z (UTC) on Jan. 2; similarly, 0400Z on Jan. 2 would be 2000U (PST) on Jan. 1.

A good method is to use UTC (Z) for *all* amateur logging, schedule-making, QSLing and other amateur work. Confusion, with all the different time zones, is inevitable. Leave your clock on UTC.

The Canadian Maritime provinces and Puerto Rico use AST (Q) time, or ADST (P) time. Canal Zone uses EST (R) time. Most of Alaska and Hawaii use W time (+ 10 to UTC).

EMERGENCY REFERENCE INFORMATION FOR AMATEUR RADIO STATION W6BHZ

Telephone Numbers
(List name and/or number)

STATE/PROVINCE POLICE_____

LOCAL POLICE_____

SHERIFF_____

FIRE DEPARTMENT_____

AMBULANCE_____

c.d._____

SCM_____

SEC_____

NATIONAL WEATHER SERVICE_____

RED CROSS_____

SALVATION ARMY_____

FCC_____

DEC_____

EC_____

_____

	Freq.	*Time*	*Days*
ARES Net			
RACES Net			
SKYWARN Net			
NTS Section/ Local Net			

WHAT TO REPORT

CALLER'S NAME:
LOCATION:
SITUATION:
Injuries: number, extent.
Fire?
Traffic Blocked?
Need Tow Truck?
Weather Conditions?

Report your activity to your Section Communications Manager (page 8, *QST*) or to ARRL, 225 Main St., Newington, CT 06111

CD-255
Printed in U.S.A.

THE AMATEUR RADIO EMERGENCY SERVICE

The radio amateur best justifies his existence by the service rendered to the community in times of disaster and distress when normal communications media are not available, have failed or are badly overburdened. The pleasure derived from the pursuit of this hobby during normal times establishes a debit that the amateur offsets only by his steadfast determination to be prepared and willing to be of service when disaster strikes.

In the event of a communications emergency all amateurs are dedicated to serve in the public interest, within their ability, to provide temporary communications for a stricken area until normal facilities are restored.

The Amateur Radio Emergency Service is composed of licensed amateurs who have voluntarily registered their qualifications and equipment for communication duty in the public service when disaster strikes.

Every licensed amateur, whether or not a member of the ARRL, is eligible for membership in the Emergency Service. The only other qualification is a sincere desire to serve. The possession of emergency-powered equipment is desirable, but is not a requirement.

Further information on the Service may be obtained from your Section Communications Manager or ARRL Hq.

BEFORE EMERGENCY

PREPARE yourself by providing a transmitter-receiver setup together with an emergency power source upon which you can depend.

TEST both the dependability of your emergency equipment and your own operating ability in the annual ARRL Simulated Emergency Test and the several annual on-the-air contests, especially Field Day.

REGISTER your facilities and your availability with your local ARRL Emergency Coordinator. If your community has no EC, contact your local civic and relief agencies and explain to them what the Amateur Service offers the community in time of disaster.

IN EMERGENCY

LISTEN before you transmit. Never violate this principle.

REPORT at once to your Emergency Coordinator so that the EC will have up-to-minute data on the facilities available. Work with the local civic and relief agencies as the EC suggests, offer these agencies your services directly in the absence of an EC.

RESTRICT all on-the-air work in accordance with FCC regulations, Section 97.107, whenever FCC "declares" a state of communications emergency.

SOS and "Mayday" are the International distress calls for emergency only. They are for use only by stations seeking emergency assistance.

RESPECT the fact that the success of the amateur effort in emergency depends largely on circuit discipline. The established Net Control Station should be the supreme authority for traffic routing.

COOPERATE with those we serve. Be ready to help, but stay off the air unless there is a specific job to be done, that you can handle more efficiently than any other station.

COPY all bulletins from W1AW. During time of emergency, bulletins will keep you posted on the latest developments.

AFTER EMERGENCY

REPORT TO ARRL headquarters as soon as possible and as fully as possible so that the Amateur Service can receive full credit. Amateur Radio has won glowing public tribute in emergencies for over sixty years. Maintain this record.

PUBLIC SERVICE COMMUNICATIONS MANUAL

PUBLISHED BY
the American Radio Relay League, Inc.

HEADQUARTERS
225 MAIN STREET, NEWINGTON, CT., U.S.A. 06111

Foreword

Public service communication has been a traditional responsibility of the Amateur Radio Service since 1913, when the first known emergency communication was conducted by an amateur. In today's Amateur Radio, it is a highly organized and very worthwhile part of day-to-day operation, implemented principally through the Amateur Radio Emergency Service (ARES), and the National Traffic System (NTS), sponsored by ARRL. The Radio Amateur Civil Emergency Service (RACES) and other amateur public service groups are also a part of ARRL-recognized Amateur Radio public service efforts.

The ARES now consists of approximately 70,000 licensed amateurs who have registered their availability for emergency operation in the public interest. Its operational leadership consists of local, district and section emergency coordinators appointed by elected administrative officials at ARRL section level called section communications managers. There are approximately 1700 emergency coordinators.

NTS is a daily-operating organization for handling medium and long-distance written traffic in standard form. It consists of nets at four levels, with lines of liaison connecting them for the systematic flow of message traffic from point of origin to point of delivery in the shortest possible time consistent with organizational training objectives and mass handlings. Its leaders are appointed either by the SCM or by the ARRL Communications Manager, depending on the level of the net in question.

A separate sub-part of the U.S. amateur regulations (Part 97, sub-part F), provides for the Radio Amateur Civil Emergency Service. RACES is a special phase of amateur operation sponsored by the Federal Emergency Management Agency, and applies to U.S. amateurs only. Its primary purpose is to provide amateurs with a special opportunity to serve governmental civil preparedness agencies.

This edition of the PSCM, revised by Assistant Communications Manager Robert Halprin, K1XA, constitutes (along with the ARRL pamphlet *Operating An Amateur Radio Station*) the most authoritative source of information on the League's public service communications program. The Appendix will provide additional operational details not covered in the rest of the booklet.

John F. Lindholm, W1XX
Communications Manager, ARRL

CD-235 (181)

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DISTRESS CALLING

For many years, ARRL had its own distress calling signals and procedures, often called the "land SOS." First this was QRR; later, when QRR was adopted internationally with a different meaning, we used QRRR, and still later "CQ Emergency" was adopted as the equivalent of QRRR on phone.

Recently the preferences of amateurs have changed, and both QRRR and "CQ Emergency" have been abandoned. Indeed, they were seldom if ever used. Amateurs are henceforth bound by the use of international distress and urgency signals. In a dire emergency situation, use SOS by Morse Code, "MAYDAY" by voice.

International regulations for distress calling and answering are far too lengthy to reproduce here. The logical place for a distress call is on an established net or other calling or emergency frequency. The SOS or "MAYDAY" call should be electrifying in stopping all operation in its tracks. Should you hear such a signal, QRT! Not until you have received the complete emergency message should you transmit, and then only if you have some reason to believe you can be of assistance. In most cases, someone nearer than you will be better able to handle it.

Any distress call, especially if transmitted "blind," should contain details such as (1) location of the emergency, (2) nature of distress and (3) type of assistance required, in addition to any other information which would enable a listener to more promptly render assistance.

DO NOT USE SOS OR MAYDAY unless emergency assistance is required! There are severe penalties for using these signals without sufficient justification.

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I — PUBLIC SERVICE

Amateur Radio exists because it qualifies as a service. Throughout our history, we amateurs have established a reputation for public service communications which is of the greatest importance to our continued occupation of frequencies. At first this service was rendered spontaneously and on an individual basis. As time progressed, the need for and value of organization became evident, resulting in the establishment of organized trunk lines and net systems and later of the Amateur Radio Emergency Service and the National Traffic System.

Today there exists in Amateur Radio a very complete and very tight volunteer organization of amateur operators for public service. Sponsored by ARRL, this field organization includes the combined facilities of the Amateur Radio Emergency Service, as it has developed since 1935, the National Traffic System as it has developed since 1949 and recognizes the Radio Amateur Civil Emergency Services (RACES) and independently-organized amateur facilities as integral parts of the Amateur Service's public service effort. These initials (ARES, NTS and RACES) and others to be introduced subsequently will occur frequently throughout this booklet.

II — THE ARRL FIELD ORGANIZATION

It is significant that Part 97 of the FCC's Rules and Regulations mentions, as the very first principle under "Basis and Purpose," the following: "(a) Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications." ARES and NTS exist as the League's implementation of this basic principle for the basis and purpose of our fraternity. ARES and NTS have much in common. Every emergency net is bound to be, to some extent, a traffic net, and every traffic net should be prepared to take on emergency duties. Emergency-conscious and traffic-conscious operators have this in common: they both derive their chief pleasure out of activities which are directly beneficial not only to Amateur Radio but also to their community and to their country.

Basic Organization and Functions

The diagram of Figure 1 will give a general idea of how the field organization is structured. While a really graphic portrayal is difficult, one can, from the diagram, get some idea how ARES and NTS tie together at top and bottom. Most ARES nets exist only at the local level, and are tied into NTS at section (usually state) level for integration into the national system. The divisions are again tied together at ARRL headquarters by a common centralizing setup in the ARRL Communications Department.

Leadership in the emergency division (ARES) is exercised by the section emergency coordinator and the district and local ECs, as shown; in the traffic division (NTS) by net managers at various levels, at the section level by section traffic managers and net managers. The SCM makes all section-level leadership and station appointments. For more information on station appointments, see *Operating An Amateur Radio Station.*

Usually, emergency operation is initiated at the local level and is the business of the ARES emergency coordinator. Even if the emergency situation transcends local and becomes of statewide, or regional, or even of national concern, the situation and what to do about it are primarily the concern of ARES officials. Communications concerning it would be generated by civic and welfare officials, or at their behest, and resulting problems handed to the ARES for solution.

While ARES and NTS are the ARRL's public service organizations, it should not be concluded that this is all there is to Amateur Radio public service or that this is the extent of the League's interest in it. On the contrary, there are many other amateur public service operating groups under different sponsorship which are a vital part of the public service function of the amateur. As such, they merit and receive the League's recognition and assistance to the extent desired and feasible.

One of them, the Radio Amateur Civil Emergency Service (RACES) is sponsored by the Federal Emergency Management Agency, and implemented at various levels of civil preparedness. Since it is permanently established as a branch of the amateur service under Part F of the amateur regulations, some of the details of its operation will be in-

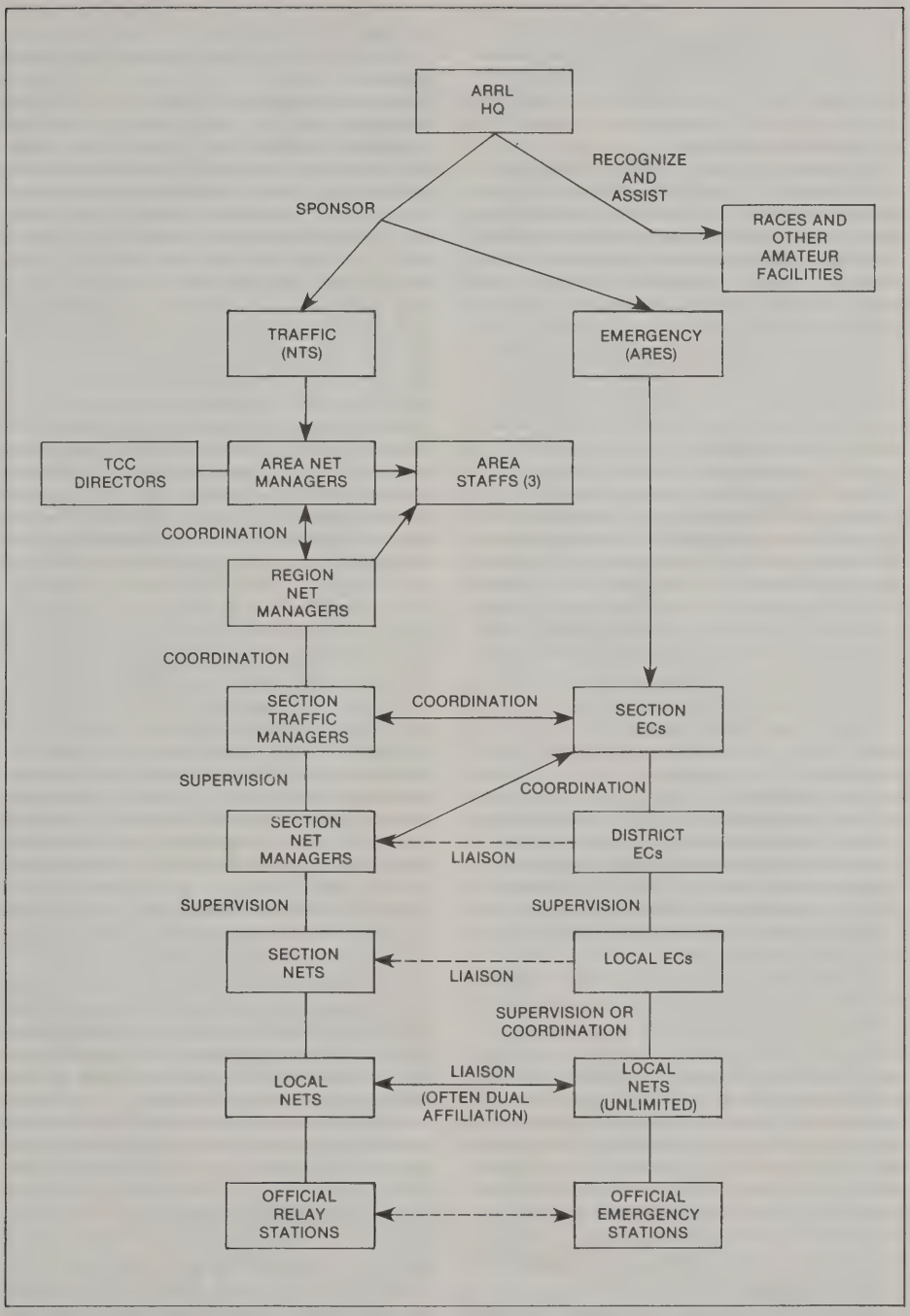

Fig. 1 - ARRL Field Organization Diagram

cluded in this publication (Part IV). Others, sponsored by other government agencies or organized and operated by amateurs outside the ARRL sphere, are more transitory in nature or not fully amateur-oriented and will be covered in *QST* magazine in accordance with current activities.

The details of the internal workings of ARES and NTS will come in for further discussion later in this booklet. Our primary topic at the present instance is that part of the setup which couples together these two divisions. This involves closely-planned liaison between them so that both in normal times and during an emergency there can be a singleness of operation and purpose. Thus, the ARES which previously considered only emergency operation, now takes on some regular-operation duties while NTS, which usually operated only routinely, now takes on some emergency-operation duties.

Normal Operation. During its every-day operation, NTS normally completes two "cycles," one during the daytime hours and one in the evening. The cycle goes from section to region to area, and back down through region and section. Special transcontinental facilities are used during both cycles to shuttle traffic among the three NTS areas. The sequence of each cycle occurs *every* day, including week ends and holidays.

There is one other echelon of NTS nets, called local nets. Such nets include those organized at city, community or county level for the purpose of handling and delivering traffic within such boundaries, even though in many cases such traffic could be delivered by landline without toll charge. This is called "neighborhood delivery" and is a valuable training phase of NTS operation which would be most useful in the event of a local communications emergency.

The establishment of this "local" echelon of NTS brings into the NTS picture hundreds of ARES nets which hold only occasional drills and which are intended to operate mainly during emergencies. If they operate at least once per week *regularly* and maintain liaison with their section NTS net, any message traffic received through the system for delivery may be routed to the point closest to delivery in the local net. The very important liaison function will require stations with considerable versatility, because most section nets operate on 80/75 meters while most local nets use VHF.

Local ARES nets are encouraged to take on regular traffic-handling functions by making liaison with NTS, and thus becoming local NTS nets. There is nothing like regular message-handling in normal times to prepare a group for team operation in an emergency situation.

Emergency Operation. For the ARES, the emergency is the culmination of all its preparatory efforts; for NTS, it is an intensive interlude in its daily operations. When an emergency situation arises, the usual procedure is for an official of a served agency (e.g., the Red Cross) to notify a representative of the amateur service (e.g., the emergency coordinator, with whom he should have had previous contact) of specific requirements for emergency communication. The EC then alerts the ARES unit via whatever prearrangements they have made and sets up the required circuits.

Such a system has worked adequately in the past for local communications purposes, but medium and long distance requirements, when needed, have usually been set up spontaneously and have shown the need for advance planning. Then NTS takes on an emergency-operation complexion for the express purpose of handling medium- and long-distance traffic. This is done by activation of certain NTS nets, as required, at section, region or area level, and of the Transcontinental Corps (TCC), depending on the extent of the emergency and the communications needs. Such activation is accomplished primarily on the initiative of the ARES official concerned, who is the man on the scene who perceives the need. In the case of a local-type emergency, the EC has ready access to the NTS section net, manager, and, if needed, he can request net activation on an emergency basis. Via this net he can also request activation of adjacent ARES nets or their participation with his group to extend local coverage if this seems indicated.

On recommendation of an SEC or STM, or at the request of a section net manager, the NTS region net might also be activated; and when or if inter-regional traffic exists, an NTS area net might be activated at the request of a region net manager.

In the final analysis, which nets are activated, to what extent, on what basis, are matters determined by ARRL officials acting together to set up the system to be used for that particular emergency. In order that this kind of coordination will work with a minimum of confusion and conflict, these amateur officials must keep in touch with and be known to each other in the normal course. Come the need, they will have established pre-arranged methods of con-

tacting each other by radio. Such methods may entail use of established nets, one or more established calling and emergency frequencies or some other mutually-agreed-upon means. Of course landline can be used if available, but should not be depended upon.

Hot Lines. During an emergency situation there occasionally develops a need for a special circuit covering two points between which high precedence traffic is heavy. Where such a need occurs between points within a section, the special circuit can be set up by the section-net manager, STM or the SEC. Where it involves points in different sections in the same region, the NTS region net manager is responsible. Where the two points are in different regions but the same area, the area net manager would make the arrangements. And where the two points are in different areas, the TCC director assigns two of his functionaries to the task. Such special circuits are called "hot lines," set up *only* when there is enough high-precedence emergency traffic to keep them busy, and are discontinued promptly when such a condition ceases to exist.

Very few emergencies and emergency situations are predictable from a national standpoint. League officials, whether their principal activity is in the ARES or NTS sphere, must have freedom of action and movement within a set of general principles, the latter being for the purpose of guiding them, not restricting them. What nets should be activated in a given situation, how often the NTS cycle should operate, what special circuits need to be set up and how this best can be done — all these are matters that have to be decided as the situation develops, by SECs, STMs, ECs and NTS net managers on the scene best qualified to decide them.

The general principles are these: (1) NTS nets will be activated in accordance with the emergency situation by their respective managers at the request of ARES officials, and (2) special inter-section circuits will be set up by National Traffic System net managers — to handle such emergency-precedence traffic as or if the need for them develops. The detailed procedure may vary considerably from place to place.

Advisory Committees

The ARRL Board of Directors has established a number of advisory committees. These committees are composed of qualified amateurs with the function of undertaking studies, reviewing proposals and communicating advice, recommendations and expertise from the League's membership to its management in various specialty areas of Amateur Radio. One of these areas is emergency communications and one of the advisory committees is the Emergency Communications Advisory Committee (ECAC).

The ECAC consists of a qualified amateur from each of the ten U.S. call areas and one from Canada. Its members are appointed by the ARRL president, who names one of them chairman. A director, vice director or an elected officer is named by the president to act as a point of contact between the committee and the Board of Directors, and a member of the Headquarters staff is similarly designated to serve such a function between the committee and the headquarters.

While there is no similar advisory committee advising on NTS matters, the communications manager many years ago set up NTS Area Staffs, one in each of the three NTS areas – Eastern, Central and Pacific. Each Area Staff consists of the region net managers, area net managers, TCC directors and three "members at large" elected by the other members. Each Area Staff also elects a chairman. In-person meetings are called by the chairman whenever in his judgment there are sufficient agenda items to make such a meeting worthwhile. NTS officials at region, area and TCC level are also authorized certain travel within their specific areas of jurisdiction to accomplish specific NTS objectives.

All of these advisory groups – the ECAC and the three NTS Area Staffs – have contributed greatly to the input of information and expertise on public service matters, including no little contribution to the current revision of this booklet.

III — AMATEUR RADIO EMERGENCY SERVICE

The Amateur Radio Emergency Service consists of licensed amateurs who have voluntarily registered their qualifications and equipment for communication duty in the public service when disaster strikes. Every licensed amateur, whether or not a member of ARRL or any other local or national organization, is eligible for membership in the ARES. The only qualification other than holding a license is a sincere desire

to serve. Since ARES is an amateur service, *only* amateurs are eligible for membership. *The possession of emergency-powered equipment is desirable, but is not a requirement for membership.*

Principles of Emergency Communication

It is impossible to state exact rules to try to cover *every* situation that will arise. The good average amateur faced with an emergency situation may, however, benefit greatly from certain rules of thumb. These rules are, or should be, part of his training in his ARES group. They are presented herewith somewhat at random and should be digested by all amateurs, whether active in emergency communications preparation or not.

1. Keep the QRM level down. In an emergency, many of the most crucial stations will be weak in signal strength. It is most essential that all other stations *remain silent* unless they are called upon. When in doubt as to whether or not to turn on your transmitter, don't. Our amateur bands are very congested. If you want to help, study the situation by *listening.* Don't transmit unless you are sure you can help by doing so. Don't ever break into an emergency net just to inform the control station you are there if needed.

2. Monitor established emergency frequencies. Many localities and some geographical areas have established emergency frequencies on which someone is always (or nearly always) monitoring for possible calls. When not otherwise engaged, it is helpful simply to sit and listen on such frequencies, some of which are used for general rag-chewing as well as emergency preparedness drilling. On cw, SOS (without spaces) is universally recognized but has some legal aspects that should be considered where the need is not truly crucial. On voice, one can use "MAYDAY" (universal, the phone equivalent of SOS) or, to break into a net or conversation, the word "emergency."

3. Avoid spreading rumors. During an emergency, especially on the phone bands, you may hear almost anything. Unfortunately, much misinformation is transmitted. Rumors are started by expansion, deletion, amplifying or modifying words, exaggeration or interpretation. *All addressed transmissions should be officially authenticated as to their source.* They should be repeated word for word, if at all, and only when specifically authorized. In an emergency situation, with everyone's nerves on edge, it is little short of criminal to make a statement on the air without foundation in authenticated fact.

4. Authenticate all messages. Every message which purports to be of an official nature should be *written* and *signed.* Whenever possible, amateurs should avoid initiating emergency traffic themselves. We do the communicating; served-agency officials supply the content of the communications.

5. Strive for efficiency. Whatever happens in an emergency, you will find hysteria, and some amateurs who are activated by the thought that they must be "sleepless heroes." Instead of operating your own station full time at the expense of your health and efficiency, it is much better to serve a shift at one of the best located and best equipped stations, suitable for the work at hand, manned by relief shifts of the best-qualified operators. This reduces interference and secures well-operated stations.

6. Select the mode and band to suit the need. It is a characteristic of all amateurs to believe that their favorite mode and band is superior to all others. For certain specific purposes and distances, one or the other may indeed be preferable. The merits of the use of each in a communications emergency should be evaluated impartially with a view to apportioning to each the type of work for which it is best suited. There is, of course, no alternative to using what happens to be available, but there are right and wrong purposes for which it might be used. Long experience has developed the following advantages:

For cw:

1) Less QRM in most amateur bands.

2) Secrecy of communications — contents of communications cannot be intercepted, generally speaking, by the general public, to start rumors or undue concern.

3) Simpler transmitting equipment.

4) Greater accuracy in record communication.

5) Longer range for a given amount of power.

For Phone:

1) More practical for portable and mobile work.

2) More widespread availability of operators.

3) Faster communication for informal or "command" purposes.

4) More readily appreciated and understood by the public.

5) Official to official and phone patch communication.

For RTTY: Advantages (1) and (2) of cw, advantage (2) of phone, plus greater speed in record communication than any other mode.

The well-balanced emergency organization will have cw, phone and RTTY channels available, in order to utilize the advantages of all three as outlined above. Of course one must make the best use of whatever is available, but a great deal of efficiency is lost when there is lack of coordination or liaison between the different types of operation in an emergency. Absolute impartiality, willingness to let performance speak for itself — these are prime requests if we are to realize the best possible results.

7. Use all communications channels intelligently. All object of emergency communications is to save lives — anything else is incidental. Amateur Radio is a secondary communications means; normal channels are primary and should be used if available. Emergency channels other than amateur which are available in the absence of amateur channels should be utilized without fear of favoritism in the interest of getting the message through.

8. Don't "broadcast." Some amateur stations in an emergency situation have a tendency to emulate "broadcast" techniques. While it is true that the general public may listen to many of our transmissions, they are not and should not be made for that purpose. Broadcast stations are well equipped to perform any such service. Our job is to communicate for, not with, the general public. FCC regulations 97.117 applies.

Principles of Repeater Operation

Much amateur operating in emergencies is done by use of repeaters, so a few words about some of the special problems involved are in order.

1. Use minimum power. If your rig has a low and high power position, use the *low position* whenever you are close enough to the repeater to get by with it. Otherwise, especially in heavily-populated areas, you may run the risk of keying more than one repeater, thus causing unnecessary QRM.

2. Use simplex (direct) operation when possible. ARRL recommends 52/52 on 2 meters, but it's a good idea to have at least one other simplex channel available. Usual procedure: when you are within a very few miles of your contact, switch to a mutually available simplex channel, to free the repeater for those who need it. The simplex channels can accommodate more simultaneous contacts than repeater channels because of shorter range. However, a gain or beam antenna at stationary locations can enhance simplex operation.

3. Observe the "pause" procedure between exchanges. When it comes your turn to transmit, after the transmitting station stands by, count to two or three before pressing your "transmit" switch. This leaves time for a "breaker" if one is on frequency.

4. Be alert for emergency and public service opportunities. A huge percentage of amateurs have 2-meter fm rigs in their cars, and highway assistance is commonplace. This is especially important in accidents which have *just happened.* In such a case, feel free to "break into" any conversation then taking place on any repeater.

5. Listen much, transmit little. Always a good procedure to announce your presence on a repeater, always a *bad* one to tie it up with idle or inane chatter.

6. Keep your mobile fm rig on standby (squelch) on a repeater or simplex channel when on the road. The League recommends 34/94 repeater (if in range) or 52/52 (if no repeater in range).

7. Think before you talk, especially in an emergency situation. Anyone with an inexpensive public-service-band receiver can monitor. Stick to facts, control your emotions, watch your language. During an emergency is the time when you are most apt to act and speak rashly.

8. Articulate, don't slur. Speak close to your mike but talk across it, not into it. Keep your voice down. In an emergency situation one often gets excited, tends to shout. Control the impulse, for it will greatly decrease your intelligibility. Talk slowly, calmly -- this is the mark of a pro. We aren't pros, but the more we sound like them the better impression we will leave.

Repeaters and Emergency Preparedness

In the past decade, most repeater operation has been conducted on 2 meters. It is a certainty that repeater operation will con-

tinue to grow and other bands will be used. Already, the 220 MHz band is receiving widespread use, and 420 is used extensively for control links and shorter-range work. Six and ten meters are also being used. The future will surely produce extensive use of satellite repeaters and HF, linked repeaters and cross-band machines for longer distance coverages in practical communication. For practical emergency preparedness work and tactical communications during emergencies, we need channels that can be depended on, day and night, all seasons of the year regardless of sunspot cycle. Repeaters supply many of the answers to this need, and we amateurs can lead the way in providing it.

Liaison with the National Traffic System is practically a must for emergency traffic being handled on repeaters. A call for a NTS station in an emergency may produce results, but even better results can be obtained if a check-in by one or more NTS stations can be planned in advance. NTS is valuable for handling any traffic that cannot be handled within the local repeater coverage area.

Organization

There are three levels of ARES organization — national, section and local. National emergency coordination at ARRL headquarters is under the supervision of the ARRL communications manager, who is responsible for advising all ARES officials regarding their problems, maintaining contact with federal government and other national officials concerned with amateur emergency communications potential, and in general with carrying out the League's policies regarding emergency communications. At section level, the section emergency coordinator is appointed by the section communications manager (who is elected by the ARRL members in his section) and works under his supervision. In most sections, the SEC and SCM work together in setting up a section emergency communications plan, and in appointing district and local ECs to implement it; in some, the SCM leaves it entirely to the SEC, who nevertheless must have the SCM's approval of everything he does. Some of the ARRL sections with capable SECs are organized to the hilt. A few have scarcely any organization at all. It depends almost entirely on whom the section members have put into office as SCM and whom he has appointed as SEC.

It is at the local level where most of the real emergency organizing gets accomplished, because that's the level at which most emergencies occur, at which ARES officialdom makes direct contact with the ARES member-volunteers and with officials of the to-be-served agencies. The local EC is therefore the key man in the ARES. This official is appointed by the SCM, usually on the recommendation of the SEC and DEC. Depending on how the SCM-SEC team has set up the section for administrative purposes, he may have jurisdiction over a small community or a large city, an entire county or even a group of counties. Whatever jurisdiction is assigned, *the EC is in charge of all ARES activities in his area, not just one interest group, one agency, one club or one band.*

Now that we have looked at the top of the section organization and the local level where the actual communications take place, it would be well to recognize that in the large sections the local groups could proliferate to the point where simply keeping track of them would be more than a full-time chore, not to mention the idea of trying to coordinate them in an actual emergency. To this end, SCMs and SECs have the option of grouping their EC jurisdictions into logical units or "districts" and appointing a district EC to coordinate the activities of the local ECs in the district. In some cases, the districts conformed to the boundaries of governmental planning or emergency-operations districts, while in others they are simply based on

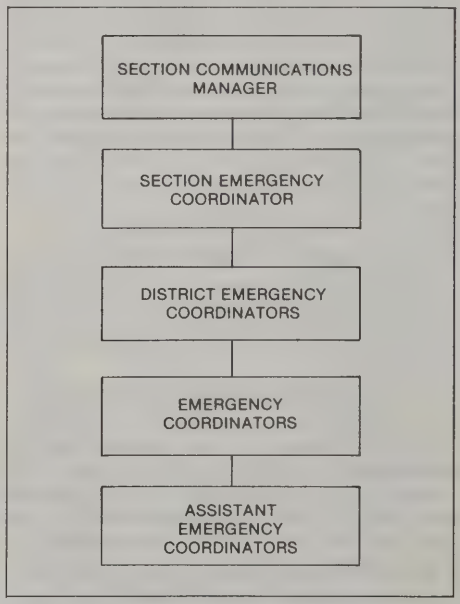

Fig. 2 — Section structure for ARES.

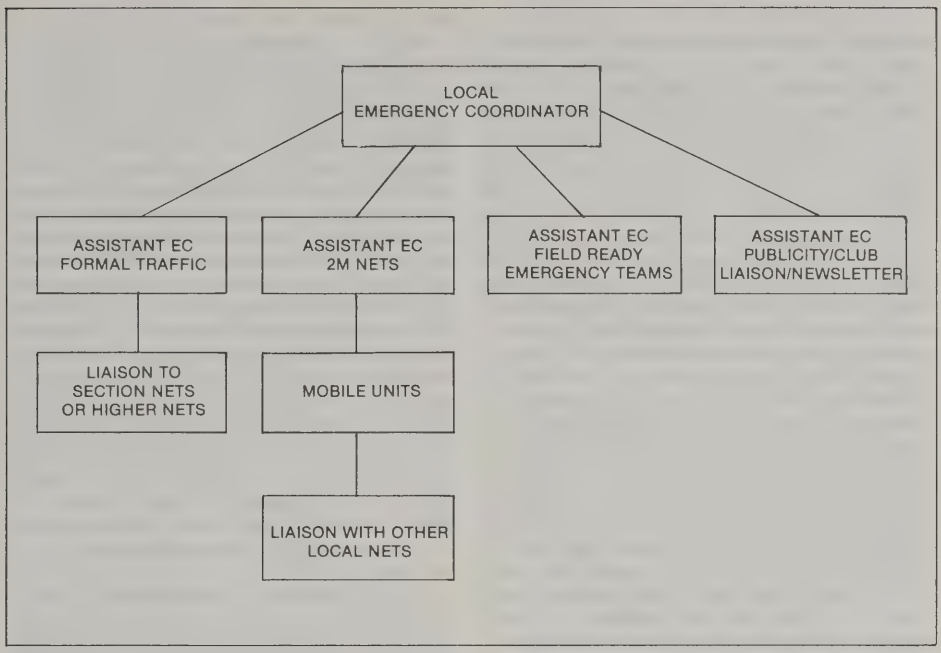

Fig. 3 — Local ARES structure.

repeater coverage or geographical boundaries. Figure 2 depicts the typical section ARES structure.

Special interest groups are headed up by "assistant emergency coordinators," designated by the EC to supervise activities of groups operating in certain bands, especially which play an important role at the local level; but they may be designated in any manner the EC deems appropriate. See Figure 3.

These assistants, with the EC as chairman, constitute the local ARES "planning committee" and meet together from time to time to discuss problems and plan projects to keep the ARES group active and in a high state of training.

There are any number of different situations and circumstances that might confront an EC, and his ARES unit should be organized in anticipation of them. His job is not likely to be monotonous or humdrum. An EC for a small town might find that the licensed amateur group is so small that appointing assistants is unnecessary or undesirable. On the other hand, an EC for a large city may find that even his assistants need assistants and sometimes it is necessary to set up a special sub-organization to handle it.

Operation

There is no specific point at which organization ceases and operation commences. Both phases are concurrent, because a living organization is a changing one, and the *modus operandi* of necessity changes with changes in the organization.

The chart on page shows how a typical ARES unit may be organized.

Just what shape the plan in your locality will take depends on what your EC has to work with. He uses what he has, and leaves provision in the plan for what he hopes, wants, is trying to get. *Flexibility* is the keynote. The personnel, equipment and facilities available today may not be available tomorrow, or the availability may be greater. In any case, bear in mind that organizing and planning are not a one-man task. The EC is simply the leader or, as the title indicates, the coordinator. His effectiveness inevitably will depend on what kind of a group he has to work with; that is, on you and your cohorts. So a good thing to do is make yourself available to your EC as a member of his planning committee, or in any capacity for which you think you are qualified.

Usually, local ARES operation will take the form of nets -- hf nets, vhf (repeater) nets, even RTTY or other special-mode nets (such as ASCII) if the area produces the required wherewithal in the form of people and equipment. Your EC should know where your particular interests lie, so that you can be worked in where your special talents will do the most good.

It is not always possible to utilize the services of all ARES members. While it is general policy that no ARES member must belong to any particular club or organization to participate in the program, local practical considerations may be such that you cannot be used. This is a matter that has to be decided on by your EC. In some cases, even personality conflicts can cause difficulties; for example, the EC may decide that he cannot work with a particular person with whom he has a personality conflict, and that the local ARES would be better served by excluding that person. This is a judgment that the EC would have to make; while personality conflicts should be avoided, that they do arise, more often than we would prefer, is a fact. The EC on the job must take the responsibility for making such subjective evaluations, just as the SEC and DEC must evaluate the effectiveness of the job being done by the EC.

Operation in an emergency net is little different from operation in any other net, except that here the object is preparation for emergency. This includes training in handling of written messages -- that is, what is generally known as "traffic handling." How to handle traffic is covered in a companion publication, *Operating an Amateur Radio Station*. This is required reading for all ARES members -- in fact, for all amateurs aspiring to participate in emergency communications.

While much communicating amateur-to-amateur in an emergency is of a procedural or tactical nature, the real meat of communicating is third-party traffic, the communications you handle involving persons other than the operators of the two stations concerned. *Most of this should be in standard message form.* True, in times of stress this is not always possible, but there is a common tendency to shirk it which should be avoided. The record should show, wherever possible, (1) a message number for reference purposes, (2) a precedence indicating its importance, (3) a station of origin so any reply or handling inquiries can be referred to that station, (4) a check (count of the number of words in the message text, so receiving stations will know whether any words were missed, (5) a place of origin, so the recipient will know where the message came from (not necessarily the location of the station of origin), (6) filing time, ordinarily optional but in an emergency-type message, of great importance, and (7) date of origin. The address should be complete and include a telephone number if known. The text should be short and to the point, and the signature should contain not only the name of the person sending the message but his title or connection also, if any.

This procedure is not something picked up solely by reading or studying. There is no substitute for actual practice. Your emergency net should practice regularly -- much more often than it operates in a real or simulated emergency. Avoid complacency, the oft-felt feeling that you will know how to operate when the time comes. You won't, unless you do it frequently, with other operators whose style of operating you get to know.

Equipment Considerations

It is not to be expected that every amateur will prepare himself for an emergency by having a complete and separate self-powered station, although a large number of individuals and groups do so. There is, however; no reason why any enterprising amateur cannot prepare his station for an emergency by having an emergency power supply ready and a quick means for utilizing all or part of his regular station equipment as an emergency-powered station. The emergency power supply can be anything from a small transistor supply operated from batteries to a large gasoline-driven generator.

Equipment most suitable for emergency use is that which contains the utmost in compactness, portability and versatility. Within these three requirements, emergency equipment is little different from any regular station equipment. It is chiefly the power supply which determines whether or not a piece of equipment is useful in emergencies.

Operation from a gasoline-driven generator need not be discussed, since normally such operation is identical to that to be expected from the commercial a.c. lines. The primary considerations concerning emergency power have to do with battery-operated power supplies. Transistor packs are used almost exclusively, these days.

Equipment used for emergency purposes can be specially designed and built, but most of today's amateur gear is compact enough

so that it can be transported rather easily. Therefore, the principal requirement is that arrangements be made to transport it quickly and set up promptly at the point from which it is to be used. Many emergency operation centers and government buildings are already equipped with emergency power, so standard a.c.-supplied units can often be used. Otherwise, batteries of some kind will be necessary: dry batteries (limited life) or rechargeable batteries such as NiCads or lead-acid or other "storage" types. The latter especially are more apt to be available, because they are used in every automobile and battery-start engine and can be recharged from those same engines, regardless of the latter's other purpose. For example, a storage battery being used to power a communications unit, when nearly spent, can be swapped for a charged-up battery in a transportation unit. Use in the transportation unit can charge it up again, at which time another swap can be made.

Mobile operation from vehicles is not the answer to everything. The availability of portable units and hand-held units is a definite asset in any emergency, making spot communications available from places where automobiles cannot go. This usually means vhf and operation from dry batteries.

Operation on vhf-fm is the "way to go" for emergency purposes in today's Amateur Radio. Repeaters are available almost everywhere, and many of them are equipped for operation in emergencies. Some ARES units even have their *own* repeaters, as do RACES and MARS groups. So, almost a necessity is equipment capable of triggering one or more repeaters in the affected area. Whether they are emergency-communications oriented or not, most of them *will* be used in an emergency situation if they remain on the air -- and most repeater owners (group or individual) will be more than willing to have them used for this purpose on a planned basis.

For emergency purposes, your best bet is a two-meter fm unit. Usually, very low power (one or two watts) is sufficient to work through most repeaters. This can be accomplished using self-contained dry batteries, although provision to use an automobile storage battery is also very helpful. Check on what the amateurs in your area are using; you may find that you would be better advised to use a different band from 2 meters, or the nearest repeater is too far away to key with one watt, in which case a different rig or one with more power may be required.

IV — THE RADIO AMATEUR CIVIL EMERGENCY SERVICE

After World War II, when it became evident that the international situation was destined to be tense and the need for some civil defense measures became apparent, successive government agencies designated to head up such a program called on amateur representatives to participate. In the discussions that followed, we were interested in getting two points across: first, that Amateur Radio had a potential for and capability of playing a major role in this program; and second, that our participation should, this time as never before, be in our own name, as an *Amateur Radio Service*, even if and after war should break out. These principles were included into the planning by the formulation of regulations creating a new branch of the amateur service, the Radio Amateur Civil Emergency Service, RACES.

Recognition of the role of Amateur Radio as a public service means *responsibility* — this time in our own name. The RACES regulations are printed in full in the ARRL *License Manual*, along with the rest of the amateur regulations, and will not be reprinted herein. Nevertheless, every amateur should study closely and become familiar with these rules; for civil preparedness, now a major function, will become our only on-the-air function if we are plunged into war.

What is RACES?

RACES, administered by the Federal Emergency Management Agency of the United States government, is a part of the Amateur Radio Service that provides radio communications for civil preparedness purposes only, during periods of local, regional or national civil emergencies. These emergencies are not limited to war-related activities, but can include natural disasters such as fires, floods and earthquakes. As defined in the rules, RACES is a radiocommunication service, conducted by volunteer licensed amateurs, designed to provide emergency communications to local or state civil preparedness agencies. It is important to note that RACES operation is authorized by the FCC upon request of a state or federal of-

ficial, and is strictly limited to official civil preparedness activity, in the event of an emergency communications situation.

Operating Procedure

Amateurs operating in a local RACES organization must be officially enrolled in that local civil preparedness group. RACES operation is conducted by amateurs using their own primary station licenses, and by existing RACES stations. The FCC no longer issues new RACES (WC prefix) station call signs. Operator privileges in RACES are dependent upon, and identical to, those for the class of license held in the Amateur Radio Service. All of the authorized frequencies and emissions allocated to the Amateur Radio Service are also available to RACES on a shared basis. But in the event that the President invokes his War Emergency Powers, amateurs involved with RACES would be limited to the following frequencies (while all other amateur operation would be silenced):

kHz	
1800-1825	3984-4000
1975-2000	7097-7125
3500-3550	7245-7255
MHz	
14.047-14.053	53.300
14.220-14.230	53.350-53.750
21.047-21.053	145.170-145.710
28.550-28.750	146.790-147.330
29.450-29.650	220-225
50.350-50.750	

While RACES was originally based on potential use for wartime, it has evolved over the years, as has the meaning of civil defense (which is also called civil preparedness), to encompass all types of emergencies. It should be emphasized again that RACES is part of the amateur service, its regulations are part of the amateur regulations, and it operates in the amateur bands. The segments of the amateur bands it uses are shared with the rest of the amateur service in peacetime; in the event of war, its frequency segments would be exclusive.

While operating in a RACES capacity, RACES stations and amateurs registered in the local RACES organization may not communicate with amateurs not operating in a RACES capacity. (Of course such restrictions do not apply when such stations are operating in a non-RACES -- such as ARES --amateur capacity.) Only civil preparedness communications can be transmitted, as defined in FCC regulations, section 97.161. Tests and drills are permitted only for a maximum of one hour per week. All test and drill messages must be clearly so identified.

ARES and RACES

Although RACES and ARES are separate entities, we advocate dual membership and cooperative efforts between both groups whenever possible. The RACES regulations now make it simple and possible for an ARES group whose members are all enrolled in and certified by RACES to operate in an emergency with great flexibility. Using the same operators and the same frequencies, an ARES group also enrolled as RACES can "switch hats" from ARES to RACES and RACES to ARES to meet the requirements of the situation as it develops. For example, during a "nondeclared emergency," ARES can operate under ARES, but when an emergency or disaster is officially declared by a state or federal authority, the operation can become RACES with no change in personnel or frequencies.

This situation is still not well understood and accepted throughout the United States; both ARES and RACES still exist, separately, in many areas. League Officials will have to determine the situation in their own area. Where there is currently no RACES, it would be a simple matter for an ARES group to enroll in that capacity, after a sophisticated presentation to the civil preparedness authorities. In cases where both ARES and RACES exist, it is possible to join both or to be involved in either. As time progresses, the goal would be the merger into one strong organization, with coordination between ARES and RACES officials using the same groups of amateurs. In some sections of the U.S. today, the ARES structure has also been accepted as the RACES structure.

Other Amateur Facilities

There are a number of other Amateur Radio facilities, not sponsored or directly affiliated with the League, which are nevertheless an integral part of our public service effort. Some of these organizations are the monitoring services, MARS, independent nets (both international and domestic), and the like. While naturally we want you to participate in organizations sponsored by your League, better to participate in a non-League-sponsored public service organization than not to participate at all. In this booklet we can not give details of the operation of these other organizations because there are too many of them, and their operations change too rapidly. Suffice it to say that they do exist, and they are worthy of your support.

V — THE NATIONAL TRAFFIC SYSTEM

Traffic Handling. The fastest and most efficient method for handling message traffic by Amateur Radio has been a primary topic of discussion in amateur circles since 1914, when Hiram Percy Maxim formed the American Radio Relay League for this purpose. At first random relaying was used, then trunk lines were set up. All this was washed out by World War I, and after the war the trunk lines were slow in being revitalized. Nevertheless, by the mid-thirties ARRL was operating 14 trunk lines crisscrossing the country, and interest had never been higher.

Again war came and suspended all such activity. After hostilities ceased in 1945 the trunk lines were again set up, but operating methods had changed and there was much dissatisfaction. Many considered the trunk lines concept obsolete in view of longer ranges, more versatile equipment, and new operating techniques developed during the war. So, in 1949 responsive to membership demand, ARRL established the National Traffic System.

A bit shaky at first, NTS soon became stabilized and has since become an established part of Amateur Radio's public service effort. It has been said, probably rightly so, that NTS is the tightest and solidest organization within the ARRL framework.

Introductory. The National Traffic System plan is a means for systematizing amateur traffic-handling facilities by making available a structure for an integrated traffic facility designed to achieve the utmost in two principal objectives: (1) rapid movement of traffic from origin to destination, and (2) training of amateur operators in handling of written traffic and participating in directed nets. These two objectives, which sometimes conflict with each other, are the underlying considerations in the National Traffic System about to be described.

This system is in daily operation. Its personnel consists mainly of those operators who, while interested in traffic handling, are unable, either through necessity or inclination, to spend more than one or two periods a week in this pursuit. Thus, NTS is a step *away* from the traditional "iron man" type of traffic handling which characterized our "trunk lines" of yesteryear. If you can spend one regular period a week handling traffic and are interested in doing so, NTS can use you.

General. The National Traffic System is an organized effort to handle traffic in accordance with a plan which is easily understood, is basically sound, and which utilizes modern methods of network traffic-handling in general acceptance today. It encompasses all parts of the ARRL Field Organization (U.S., Canada and possessions).

NTS is not intended as a deterrent or competition for the many independently-organized traffic networks. When necessitated by overload or lack of outlet for traffic, the facilities of such networks can function as alternate traffic routings where this is indicated in the best interest of efficient message relay and/or delivery.

One of the most important features of NTS is the "system concept." No NTS net is an independent entity which can conduct its activities without concern for or consideration of other NTS nets. Each net performs its function and *only* its function in the overall organization. To whatever extent nets fail to perform their functions or perform functions intended for other nets, to this extent is the overall system adversely affected.

Nets may sometimes find it necessary to adopt temporary expedients to insure movement of traffic, and this is considered improper operation only when no attempt is made to return to the normal schedule. Nevertheless, improper operation of any NTS net is the concern of *all* NTS nets, and every effort should be made to assist in returning any nonfunctioning or improperly functioning net to its normal operation.

Membership. Individual station participation in NTS is recognized by issuance of certificates (see p. 22). Organizationally speaking, the "members" of NTS are the nets which participate therein. Most such nets were created and organized for NTS purposes only and operate at specific times for specific purposes to be described later. Procedures are somewhat specialized, particularly at Region, Area and TCC levels.

Frequently ARRL headquarters is asked how a net may become a part of NTS. This usually isn't easy, because NTS is not a "club for nets" which any existing net may join at will. In addition, making nets a part of NTS is less a matter of official action than a "state of mind" of the net itself. In this connection, the following points deserve mention:

a. Nets operating with ARRL section boundaries, or otherwise at local or section

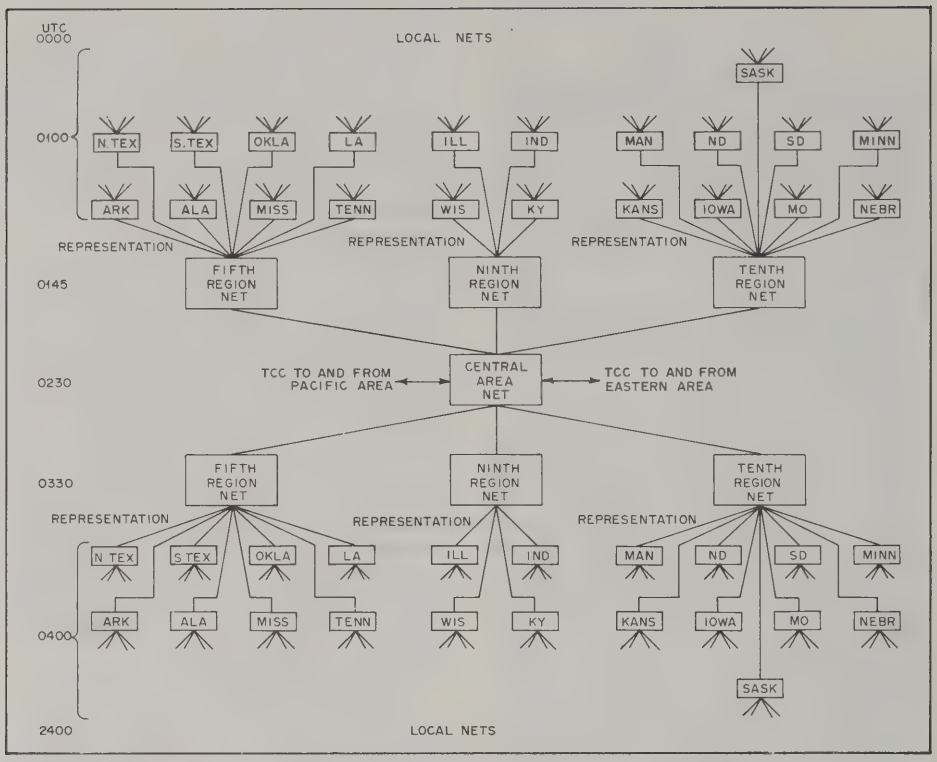

Fig. 4 — A diagrammatical portrayal of the evening (or cycle four) NTS setup in the Central Area, showing times of net meetings at the various levels in UTC. Note that the early and late functions of local nets are combined at 2400/0000. Some of the other net echelons have alternatives not shown above.

level, may become a part of NTS by performing the functions of such (see paragraphs on section nets, page 17).

b. Nets whose coverage extends beyond section boundaries but within region (roughly, call area) boundaries may become a part of NTS only by foregoing their general membership and setting up to operate as a session of the region net (see paragraph on region nets, pages 17-18). Such nets would act as one of that region's net sessions and would be under the jurisdiction of the region net manager appointed by ARRL. In all NTS history so far, no net has succeeded in adapting itself to the NTS regional function. All present NTS region nets were organized specifically for that purpose.

c. Since operation at area level is so specialized, it is not possible for nets whose coverage extends beyond region boundaries to be a part of NTS at any level.

d. Any net which becomes a part of NTS is expected to observe the general principles of NTS procedures as outlined in Appendix I herewith.

e. Generally speaking, participation in NTS is best performed by individual-station participation in an already-existing NTS net, at whichever level.

f. Lack of recognition as an NTS net does not imply that such a net is without ARRL recognition or support. All public service nets on which information is received are included in the League's net information and activities often summarized monthly in the appropriate part of *QST*. Although NTS is the League-sponsored organization for systematized traffic handling, it is far from being the League's only interest in public service communication.

Mode. The National Traffic System is not dedicated specifically either to phone or cw, or any other type of emission, nor to the ex-

clusion of any of them, but to the use of the best mode for whatever purpose is involved. The aim is to handle formal written traffic *systematically,* by whatever mode best suits the purpose at hand. Whether phone, cw, or radioteletype is used for any specific purpose is up to the net manager or managers concerned and the dictates of logic. There is only one National Traffic System, not separate ones for each mode. Modes used should be in accordance with their respective merits, personnel availabilities and liaison practicalities. Whatever mode or modes are used, we all work together in a single and thoroughly integrated National Traffic System.

Principles of Operation

The National Traffic System consists of four different levels of nets which operate in an orderly time sequence to effect a definite flow pattern for traffic from point of origin to point of destination. A message flows through the National Traffic System in a manner similar to an air line passenger who starts out in a small residential town with a destination across the continent in another small town. He has to change carriers many times in the process, starting with a local ground conveyance to a feeder air line, to a transcontinental air line, to another feeder air line, then local transportation to deliver him to his destination. In a very similar manner, the transcontinental message starts with the originating station in a local net, is carried to the section net, the region net, the area net, via Transcontinental Corps (TCC) to a distant area net, then back down the line to delivery.

Of course the message, like the passenger, can "get on" or "get off" at any point if that's its origin or destination. Thus, a message from, say, New York to Detroit would never get on TCC, but would "get off" at *area* level. A message from San Francisco to Los Angeles would not go beyond *region* level, and one from San Antonio to Houston would remain inside the *section* net.

Local nets are those which cover small areas such as a community, city, county or metropolitan area, not a complete ARRL section. They usually operate by vhf (typically 2-meter fm) at times and on days most convenient to their members and are often designated as "emergency" (ARES) nets that do not specialize in traffic handling. The time slot designated for them in Fig. 4 is thus nominal and will vary considerably. Local nets are intended mainly for local delivery of traffic on an emergency basis, inasmuch as such delivery could ordinarily be effected conveniently by non-toll telephone. Some NTS local nets operate on a daily basis, just as do other nets of the system, to put the traffic as close as possible to its actual destination before delivery – a matter of practice in a procedure that might be required in an emergency.

Use of Repeaters. Most local nets and even some section nets in smaller sections are using repeaters to excellent effect. Average coverage on vhf can be extended tenfold or more using a strategically located repeater, and this can achieve a local coverage area wide enough to encompass many of the smaller sections. Since propagation conditions on the high frequencies are erratic, more use of vhf and repeaters is recommended at local levels.

Section Nets. Organizational and procedural lines begin to tighten at the section net level. Coverage of the section may be accomplished either by individual stations reporting in, or by representatives of NTS local nets, or both. Ordinarily, all section amateurs are invited to take part; however, in a high-population section with several metropolitan areas covered by local nets, representation may be by such liaison stations *plus* individual stations in cities or towns not covered by local nets.

The section may have more than one net (e.g., a cw net, a vhf net, a ssb net, etc.), or two or more sections may combine to form a single net operating at section level, if low population or activity seem to make this desirable. Section nets are administered through the office of the section communications manager, with authority for this function usually delegated to an appointed section traffic manager or designated net managers. In the case of combined-section nets, officials of the sections concerned should collaborate on the designation of a qualified amateur to manage the net. The purpose of the section net is to handle intra-section traffic, distribute traffic coming down from higher NTS echelons, and put inter-section traffic in the hands of the amateur designated to report into the next-higher NTS (region) echelon. Therefore, the maximum obtainable participation from section amateurs is desirable.

Region nets cover a wider area, such as a call area. At this level the object is no longer mass coverage, but *representation* of each ARRL section within the region. Par-

ticipants normally include (1) a net control station, designated by the region net manager, (2) representatives from each of the various sections in the region, designated by their section net managers, (3) one or more stations designated to handle traffic going to points outside the region, designated by the region net manager, (4) one or more stations bringing traffic down from higher NTS echelons, and (5) any other station with traffic for some point within that region, but not within his own section. There may be more than one representative from each section in the region net, but more than two are usually superfluous and will only clutter the net; however, all section representatives are required to represent the entire section, not just their own net.

The purpose of the region net is to exchange traffic among the sections in the region, put out-of-region traffic in the hands of stations designated to handle it, and distribute traffic coming to the region from outside among the section representatives. Region nets are administered by net managers appointed by ARRL headquarters under the supervision of the ARRL communications manager.

Area Nets. At the top level of NTS nets is the area net. In general, the area net is to the region net what the region net is to the section net; that is, participation at area level includes (1) a net control station, designated by the area net manager, (2) one or more representatives from each region net in the area, designated by the region net managers, (3) stations designated to handle traffic going to other areas, (4) stations designated to bring traffic *from* other areas, and (5) stations having traffic for points in the area not their own region. Points (3) and (4) are functions of the Transcontinental Corps, to be described later. There are three areas, designated Eastern, Central and Pacific, the names roughly indicating their coverage of the U.S. and Canada except that the Pacific Area includes the Mountain as well as the Pacific time zones. Area nets are administered by managers appointed under the jurisdiction of the ARRL communications manager.

Transcontinental Corps. The handling of inter-area traffic is accomplished through the facilities of the TCC. This is not a net, but a group of designated stations who have the responsibility for seeing that inter-area traffic reaches its destination area. It is administered by TCC directors, in each area, who assign stations to report into area nets for the purpose of "clearing" inter-area traffic, and to keep out-of-net schedules with each other for the purpose of transferring traffic from one area to another. Further details of TCC operations are contained in Appendix III (see p. 27).

Sequence of Net Meetings. The order in which the various nets meet is essential to the proper operation of the system. The effectiveness of the National Traffic System depends on a delicate balance of voluntary cooperation and adherence to established procedures. Accordingly, the NTS Inter-Area Staff (consisting of representatives of each of the three area staffs) recommended a symmetrical, four cycle NTS net sequence, which is being implemented on a one-year trial basis. The schedule, in local time, is as follows:

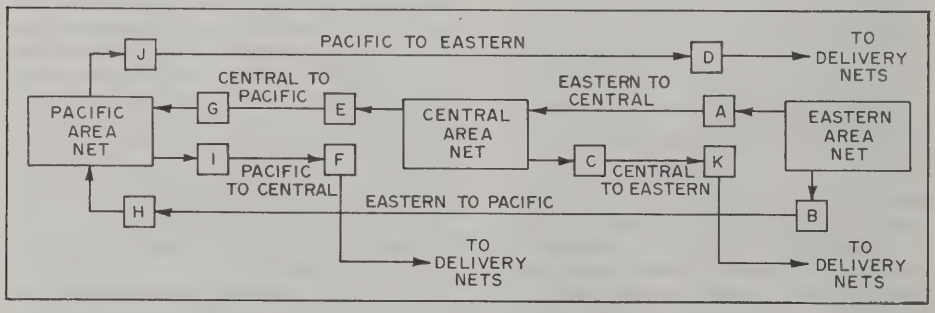

Fig. 5 — How cycle four TCC works. Small blocks denote daily station functions, station A being the only one that reports into an Area Net other than its own. Note that traffic from east to west goes into area nets while traffic from west to east may go into section or region nets to save time.

Cycle ONE	Cycle TWO
10:00 a.m. Section	1:00 p.m. Section
10:45 a.m. Region	1:45 p.m. Region
11:30 a.m. AREA	2:30 p.m. AREA
12:30 p.m. Region	3:30 p.m. Region
Cycle THREE	**Cycle FOUR**
4:00 p.m. Section	7:00 p.m. Section
4:45 p.m. Region	7:45 p.m. Region
5:30 p.m. AREA	8:30 p.m. AREA
6:30 p.m. Region	9:30 p.m. Region
	10:00 p.m. Section

Cycle Four is the basic NTS evening schedule of long-standing. Cycle Two was activated on June 1, 1980, as the basic daytime NTS schedule. Cycles One and Three are plugged in specifically for high-volume situations, to improve and enhance the response of NTS to emergency and overload situations. If needed, the entire system can be activated in three-hour shifts. Cycles Two and Four form the daily NTS schedule during normal conditions.

A few features of this NTS structure may need some elaborating: In essence, the Inter-Area plan paves the way for NTS to truly be one, unified system, not separate-but-equal daytime and evening communities. The primary function of TCC (Transcontinental Corps) is to link, rather than isolate, the two cycles. For example, prior to June 1, evening TCC bypassed the daytime cycle, thereby causing unnecessary delays in traffic delivery.

As evidenced by the schedule, the Inter-Area plan calls for each area net (PAN, CAN, EAN) to hold one session per day at 2:30 P.M. local time, the same concept as in the evening cycle, where each net meets at 8:30 P.M. local time. Area nets then have a minimum of 60 minutes alloted to them, daytime or evening, and all 60 minutes are available for the clearing of inter-area (TCC) traffic. The system is symmetric, regular and repeatable. This means first, that the structure of the net sequencing is consistent from area to area, and second, that a net session occurring at a given local time in the Eastern area should subsequently occur at the corresponding local times in the Central and Pacific areas.

Modifications to the system schedule for emergencies and emergency-preparedness exercises, such as SET, augment the basic cycles and are replications of the basic cycles. More importantly, normal daily sessions of nets at all levels of the system (ideally) remain intact during emergency operations. Expansion of the system during overloads is simple, involving a duplicate of the existing schedule, slid over three hours. Therefore, in addition to the normal area net sessions at 2:30 P.M. (Cycle Two) and 8:30 P.M. (Cycle Four), potential new area net sessions at 11:30 A.M. (Cycle One) and 5:30 P.M. (Cycle Three) can be held, along with their associated region and section nets. Again, Cycles Two and Four serve as the basic daily NTS schedule.

Traffic from EAN to CAN in either the daytime or evening cycle is handled by direct QNI into CAN by the TCC operator. All other TCC functions are out-of-net schedules, allowing optimum choice of bands and mode to fit varying propagation conditions. The time between the end of the daytime PAN session and the start of the evening EAN session allows for an out-of-net TCC sked followed by direct section net QNI on the east coast, to speed up the same day delivery service. TCC skeds are from one cycle to the same cycle for westbound traffic, or from one cycle to the next immediate cycle for eastbound traffic. That is to say, TCC functions which bring traffic from the west coast to the east coast, for example, connect the daytime PAN session with evening nets in the east, or the evening PAN session with the next daytime EAN sequence. The significance of this concept is that it combines the discipline and training of a predertermined schedule, with the spontaneous determination of the level of activity required for any specific emergency exercise.

The goals of the Inter-Area plan are as follows:

Make daytime and evening NTS actually part of a single, unified system.

Resolve net time-conflicts between areas.

Enhance daytime/evening participation.

TCC functions providing daytime/evening crossovers, so that traffic is delivered in the next available cycle of NTS, regardless of time of day or mode.

The system will be consistent from area to area, from cycle to cycle.

Evening participants will understand (and support) the daytime cycle and vice versa, with no additional training.

No traffic will be compromised for any other traffic by irregular net sequencing.

Options. NTS is a volunteer traffic system, and it is not always practical to find traffic stations able to participate in nets at various levels at particular times. While in principle NTS nets find the personnel who can participate at the time designated, rather than

change the time to suit the personnel, there is occasionally a necessity for a certain amount of non-uniformity in net meeting time, and options may be used at the discretion of the net manager. However, any such options are to be considered temporary and a return to normal NTS-recommended operating times should be made as soon as possible. The times designated in the chart are, therefore, the *normal* NTS operating times, and the nets listed show the *starting* times of those nets. The identity of participants in each of these nets is discussed in the previous section.

Whenever changes from normal routings and sequences are made, headquarters should be notified so that information on them will be available at a centralized point. In NTS, the right hand should always know what the left hand is doing. No NTS net should consider itself independent of or unconcerned with the functioning of other parts of the system.

Deviation from Normal Routing. Failure to use the normal routings described above, if carried to the extreme, will result in "strangulation" of one or more NTS nets at region or area level. That is, if section nets send representatives to other section nets to clear traffic direct instead of through the region net, the region net will "starve" for traffic. Similarly, if region nets maintain liaison with each other direct instead of through the common medium of the area net, the latter will have little traffic and will not prosper. It is in the interest of efficiency, organization, system, training and conservation of skilled personnel to use the NTS structure as it is intended to be used.

However, let's not be ridiculous. Those who would follow the system to the letter are occasionally guilty only of unnecessarily delaying delivery. Any station in NTS, regardless of the function he is performing, who receives a message destined to a point in his local calling area, should deliver that message rather than filter it further through the system. There are many metropolitan areas which straddle NTS net coverage boundaries but have common toll-free telephone coverage.

Adherence to Schedules. Since NTS depends for its efficiency on chronology of net meetings, it naturally follows that adherence to NTS schedules is of the greatest importance. Particularly TCC and liaison stations should not be held on any NTS net beyond the time they are scheduled to meet another net, *even if all their traffic has not yet been cleared.* Leftover traffic should be held, put on alternate routes, or handled by special schedule later.

Along the same line, NTS nets should not operate beyond the time allotted to them. See time sequence on p. 19 to determine normal length of nets at various levels in the two cycles.

Alternate Routings. Deviations are made from normal routings *only* when normal channels are for some reason not available. A return to the use of normal NTS channels should be made as soon as possible. The net manager shall be the judge as to whether normal facilities are available, satisfactory or adequate in making any deviations. Alternate routings, if and when necessary, can include regular or specially-arranged schedules, direct liaison to the NTS destination net, or use of the facilities of independent networks.

QNI Policy. National Traffic System nets at local and section level are open to all amateurs in the coverage area of the net. At region and area level, participation is normally restricted to representatives of sections, and designated liaison stations. However, stations from outside the coverage area of the net concerned, or other not-regularly-designated participants who report in *with* traffic will be cleared provided they can maintain the pace of the net as to procedure, speed, and general net "savvy." Such stations reporting in *without* traffic will immediately be excused by the NCS unless they can supply outlets not at that time available through normal NTS channels. Visitors to NTS nets should bear in mind that NTS nets operate on a time schedule and that no offense is intended in observance of the above QNI policy.

Boundaries. NTS net coverage areas are strictly defined and strictly observed in daily operation of the system, at section level, by ARRL section boundaries, at region level accordance with the grouping of the sections into NTS regions based originally on call areas. Some of the regions are on call area basis (1st, 2nd, 3rd and 8th), but others cover parts of two or more call areas. At area level the original basis was standard time zones, and the boundaries still roughly follow these lines without dividing any sections. The NTS area and region map (Figure 6) and routing guide (p. 34) give full details of boundaries of the various NTS echelons of operations.

Fig. 6 — National Traffic System Area and Region Map.

Sections can be changed from one region to another at the request of the SCM thereof provided no disruption of the system's operation is involved. Normally, such requests will be considered only for sections located on boundary lines between regions. The time zone in which a section or region is located or mostly located exerts a strong influence in its assignment to a region and area.

Nomenclature. NTS nets at region and area level officially carry the name of the region or area they cover (e.g., Sixth Region Net, Pacific Area Net, etc.). Net "designations" at these levels vary somewhat (e.g., First Region Net is 1RN, Fifth Region Net is RN5, Twelfth Region Net is TWN and Eleventh Region Net, the only Canadian region net, calls itself Eastern Canada Net and uses the designation ECN). Section nets customarily carry the name of the section or sections they cover, but the actual name used is optional with the net. Some examples are Pine Tree Net (Maine), Buckeye Net (Ohio) and Northern California Net (five Calif. Sections).

Combined Section Nets. Some ARRL sections which have little or no traffic interest have not organized section nets, while in some cases two or more sections have combined their facilities into a single net operating at section level. This latter practice is considered a desirable one where circumstances make it necessary and feasible, and such a combined-section net can participate in NTS in the same way as any other section net, with each representative thereof representing both (or all) sections covered.

It is recommended that traffic handlers in sections which do not at present boast a section traffic net take steps to organize one for NTS representation. Lacking this, it might be possible to participate, temporarily at least, in the NTS net of an adjoining section, and be considered members of that section's net until such time as it is feasible to

establish one. Such an arrangement, of course, requires the acquiescence of the SCM, STM and net manager of the section net concerned.

Limited Load Capability. Because the system operates on a time schedule with a definitive flow pattern, NTS has difficulties under heavy load just as do all communications systems. Thus, in normal times, the system observes the "limited load" policy. It is the general policy on NTS to strive for handling the greatest quantity of traffic through *efficiency* rather than through long hours of operation. NTS nets must *begin and terminate* within certain time limits in order that liaisons can be maintained without delay. If traffic is not all cleared within the time limit, it is considered "overflow" traffic and must use alternative routings or be held over.

Load capacity can be increased by providing additional stations to carry on liaison functions and TCC operations; by providing separate receive and transmit stations; and by pre-net sorting of traffic by region (outside the area of origination) and area, and concentrating the traffic in the hands of separate operators. This allows more expeditious operation in the area net.

Observation of Time. In order to avoid confusion and effect standardization, NTS nets should endeavor to meet at the times officially designated for them in this booklet. Where temporary departures are necessary, care should be taken that this will not adversely affect the traffic flow or cause interference to other NTS nets because of time differences.

Frequencies. There is no specific NTS frequency plan at the present time. Each NTS net selects its own operating frequency in consideration of its requirements, with the advice and assistance of ARRL headquarters if desired. Because in an emergency it may be necessary to operate many NTS nets simultaneously which ordinarily operate at different times, it is desirable for nets within normal interference range of each other to use different center frequencies if possible. Within this consideration, it is also desirable to concentrate NTS operation on as few spot frequencies as possible for two reasons: (1) to conserve frequency space, and (2) to make *full* utilization of those spot frequencies used in order to help establish occupancy. ARRL's Net Directory records net frequencies and times and is useful to study in planning new nets.

Manager Appointments. NTS net managers at local and section level are appointed or designated by the SCM. All other NTS managers are appointed at the direction of the ARRL communications manager after recommendation from the area staff concerned and coordination with the SCM of the section in which the candidate resides. Net managers are appointed for no specific term of office.

Certification. NTS certificates are available at section, region, area and TCC level. Section net certificates are issued by the SCM, region and area net certificates by the net managers. A participating station is eligible for a NTS net certificate when it has completed three months of performance (at least once per week), on an assigned basis, of one or more of three essential duties:

1) Regular participation as a net station. In the case of region and area nets, this means official representation of a section or region within its respective region or area. *No credit is given in region or area nets for random participation.*

2) Liaison with other nets of the National Traffic System. This applies only to *regular* liaison in accordance with the NTS flow pattern *as assigned by the appropriate net manager.* In the case of section nets, liaison with their proper region nets; in the case of region nets, liaison with their proper area nets; in the case of area nets, liaison with other area nets through regularly-assigned functions in the Transcontinental Corps.

3) Net control station.

Certification in the Transcontinental Corps is available through the TCC area director on completion of at least three months of regular performance of an assigned function.

Net managers (or TCC directors) may use their discretion in "excusing" any station working for a certificate if that station is unable to perform its regular duty in any specific instance. Net managers (or TCC directors) shall be the sole judges as to whether a duty, even though performed regularly, is performed adequately to merit certification.

Special Liaison Method. Often managers at region and area levels will find that while one section or region can send few or no liaison stations, others have sufficient personnel to send several. In such cases, it is possible and perfectly permissible for the higher-level manager to propose to the lower-level manager to arrange that any excess personnel be used to effect liaison not being properly performed through lack of available

stations. *Example:* The manager of the Umpth Region Net finds that many stations are available to represent Section A in his region, but Section B is seldom represented. He contacts the manager of the Section B Net and proposes that a Section A station be sent to the early meeting of Section B to take its "thru" (out of section) traffic. This station then brings such traffic to the Umpth Region Net to be distributed among net stations as required. Also, a Section A station in URN may be designated to receive all Section B traffic; this station then reports into the Section B Net to clear this traffic. Both receiving and sending functions must be completed for full representation.

The above is an alternative method of getting the traffic through and is under no circumstances to be used in preference to having a station from the section itself report to the region net. Normally, liaison of a lower-echelon net to a higher-echelon net is the responsibility of the manager of the lower-echelon net.

Operating in Emergencies

The National Traffic System is dedicated to communications during emergencies on behalf of ARES, as well as the daily handling of routine third party traffic. When an emergency situation arises, NTS goes into complete or partial emergency operation depending entirely on the extent of the emergency situation and the extent of its effect. The normal cycles are expanded as required by the situation, so that more traffic can be handled and so that it can be handled more rapidly. In the extreme case, the cycles can operate continuously, with required representation present in all nets continuously, stations designed for this function replacing each other as others are dispatched to the higher or lower nets with which they make liaison.

The question arises: who alerts or activates NTS nets in an emergency and who determines which net or nets should be activated? ARRL emergency coordinators in disaster areas determine the communications needs and make decisions regarding the disposition of *local* communications facilities, in accordance with the need and in complete coordination with agencies to be served. Section emergency coordinators study the situation on a section-wide basis and make recommendations to the section traffic manager and/or NTS managers at section and/or region levels.

While the EC is, in effect, the manager of NTS nets operating at local levels, and therefore makes decisions regarding their activation, managers of NTS nets at section, region and area levels are directly responsible for activation of their nets in an emergency situation, at the behest of and on the recommendation of ARES or NTS officials at lower levels. The following "check lists" apply to officials at the levels indicated:

Section Traffic Managers, Section Net Managers. (1) You may be contacted in any emergency by the SEC, to activate your section nets, whether NTS or not, either to provide section-wide contact or, in the case of NTS nets, to provide liaison with the "outside". Have some means of activating your net(s) at any time. We suggest that you make it understood in your net that in the event of an emergency, net stations monitor the net frequency. Some net stations, at locations badly needed, can be activated by telephone if need be and if available.

(2) Make contact with your region net managers (NTS) in the event communications connected with the emergency transcend section boundaries, recommending extraordinary activation of the region NTS net. Thus, have some prearranged method of contacting him for this purpose.

(3) Designate net stations to conduct liaison with the NTS region net, either through another section net or direct. This is *your* responsibility, not that of the region net manager.

NTS Region Net Managers. (1) Any one of the NTS section net managers in your region may contact you should an emergency situation develop. Try to predict such contact on the basis of circumstances and be available to receive their recommendations.

(2) Make contact with your area net manager (NTS) in the event communications connected with the emergency transcend region boundaries, recommending extraordinary activation of the area NTS net. Thus, have some prearranged method of contacting him for this purpose.

(3) It is *your* responsibility to see that the region is represented in any extraordinary session of the area net, in addition, of course, to all regular sessions.

NTS Area Net Managers. There are only six of these, but their function in emergencies is of paramount importance.

(1) Maintain a high sensitivity to emergencies in your area which extend or may extend beyond region boundaries. When one does, *take the initiative* to alert the region net

manager involved to determine if extraordinary NTS operation is indicated.

(2) In the event high precedence inter-area traffic is involved, contact the TCC director in your area and make arrangements to clear the traffic to other areas.

(3) Contact other NTS area net managers to confer on possibilities of their having extra net sessions if deemed required to handle the traffic reaching them through NTS inter-area handling. Under some circumstances, direct representation or "hot lines" may be indicated.

(4) Maintain close contact with all region net managers in your area and make decisions regarding overall NTS operation in consultation with them.

Transcontinental Corps Directors. These NTS officials will be involved only where high-precedence traffic is to be handled between NTS areas.

(1) Be ready to alert your TCC crew and set up special out-of-net schedules as required.

(2) You may be called upon by the area net manager to set up "hot line" circuits between key cities involved in heavy traffic flow. Bear in mind which of your TCC stations are located in or near enough to large cities to man such circuits.

A diagram of the NTS alerting plan is depicted in Figure 7.

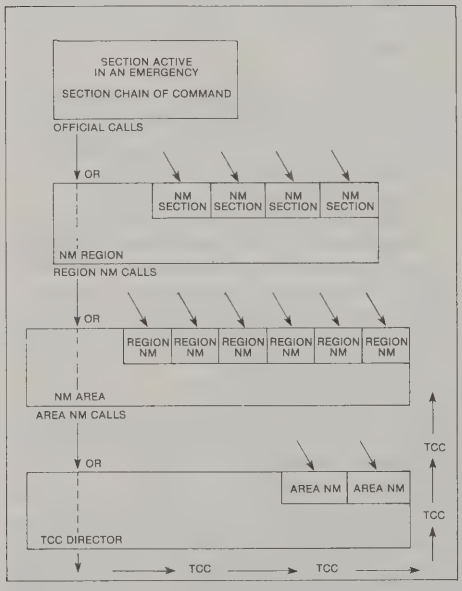

Fig. 7 — NTS alerting plan.

General Policy. NTS operators should be self-alerting to emergency conditions that might require their services, and should report into an appropriately-assigned net or other function without being specifically called upon. That is, the assignment should have been worked out with your net manager *in advance.* Each NTS operator should ask himself: "What is my emergency assignment? If I hear of an emergency condition, what should I do?" If he cannot answer the question, he should seek an answer to it through his net manager. It may be as simple as "report into the X Net on X frequency"; or, if the operator concerned is one of highly specialized, it might be "report to your TCC director in the X net on X frequency for a special assignment." Such an assignment might be an extra TCC function, or it might be as a functionary in a "hot line": point-to-point circuit needing special abilities or equipment.

Flexibility is needed, but a definite assignment pertaining to emergency operation is something that all NTS operators should have. If you don't have one, push the matter with your net manager. *NTS should be the front line of available Amateur Radio emergency communication,* especially for medium and long haul purposes.

Health and Welfare Traffic. One of the biggest problems in an emergency is the handling of so-called "health and welfare" traffic or "disaster welfare inquiries." The ARRL-recommended precedence for this type of traffic is W or "Welfare," and refers to either an inquiry as to the health and welfare of an individual in the disaster area or an advisory from the disaster area that indicates all is well. Inevitably, the influx of W traffic into the disaster area will be large, and NTS will be called upon to assist with this overload. The NTS policy with respect to the handling of W traffic is to handle as much of it as possible, but to adhere to its precedence. Higher-precedence traffic must be handled first, W traffic only when the circuit is free. Routine (R) traffic is not normally handled by an NTS net operating under emergency conditions, because usually they more than have their hands full with higher precedences, but should an emergency circuit be temporarily available, there is no reason why it can not be handled until the circuit again becomes occupied with higher precedence traffic.

In a widespread emergency system it is seldom possible to handle all the "Welfare" traffic with efficiency and dispatch. Sometimes, in fact, such traffic piles up

alarmingly, to the extent that much of it is never delivered. There are a number of ways in which this can be controlled, but few of them are consistent with public relations objectives. The best way to handle such situations is to maintain close contact with the Red Cross or the Salvation Army as appropriate, since most inquiries are handled through these organizations. Civil preparedness organizations also can often set up procedures for handling such traffic. In the past, special RTTY (or ASCII) circuits have been established, with great success. *Until or unless means for handling such traffic are established, it is usually wisest not to accept it* from the general public, or to do so only with an explicit understanding that chances of delivery are not guaranteed.

APPENDIX I — NTS NET PROCEDURES

The following procedures are recommended as an NTS standard and should be used by NTS nets. Deviations from it are made at the discretion of the net manager in cognizance of either necessity or desirability arising out of extraordinary circumstances, but always as a temporary expedient until standard procedure can be resumed.

(a) *General.* The following procedures apply to all NTS nets:

(1) The net control station (NCS) transmits a CQ plus the net designation promptly at the net meeting time.

(2) Stations reporting in indicate their function or the destination(s) for which they can take traffic, followed by the list of traffic on their hook, if any.

(3) Time-consuming pleasantries and other superfluous matter are not to be a part of the procedure while the net is in session.

(4) Net stations follow the direction of the NCS without question or comment if such directions are understood.

(5) Explanations of any kind are not transmitted unless they are absolutely essential to the net's conduct.

(6) Stations reporting into a net are held for 15 minutes, after which they are excused if there is no further traffic for them at that time. Others are excused (QNX) as soon as there is no further traffic for them or, unless in an emergency, at the regular net closing time. Stations in the net do not leave the net without being excused and do not ask to be excused unless absolutely necessary.

(7) All nets follow the general precepts of net operation outlined in the ARRL booklet *Operating An Amateur Radio Station,* and the publication *The ARRL Operating Manual.*

(b) *Section Nets.* The random call-up method should be used in most cases. The clearing of traffic should commence as soon as stations reporting in the net have traffic for each other, rather than waiting until all stations have reported in. The use of side frequencies (QNY) should be used extensively. The QNA procedure (stations answering in pre-arranged order) should only be used in times of traffic overload, or for acknowledging the region net representatives at the beginning of the net.

The following additional procedures are used in Section Nets:

(1) Stations reporting in to the net with traffic, list the destination city first, then the number of messages for that city. *Example* — "W2RQ DE AA2Z QTC Paterson 1 AR" Traffic destined outside the section is designated "through" (or "thru") followed by the number of "thru" messages. "Thru" traffic can also be listed for the appropriate region net.

(2) The region net representative is selected beforehand by the section net manager, but nevertheless indicates his purpose in reporting in. *Example* — "W2RQ DE W2UEZ 2RN TX QRU AR."

(3) Stations do not list their traffic until first recognized by the NCSs.

(4) If a particular city for which there is traffic is not represented on the net, the NCS may inquire who will handle such traffic (QNW), direct that it be sent to the station who can take it to a 2-meter local net for delivery, or who is nearest the destination, or that it be mailed. In any case, there should be a minimum of discussion, particularly if traffic is heavy.

(c) *Region Nets.*

(1) Stations reporting in indicate the *section* they came from if they are officially reporting for that purpose of handling traffic to or from that section. If their function is limited to sending or receiving, they should so indicate; otherwise the NCS will assume the station will do both.

(2) Traffic for destinations in the region are reported by *section.* If the destination is outside the region, the traffic should be designated "thru" or for the area net. *Example* — "W9JUJ DE W9QLW QIN QTC WIS

3 ILL 2 CAN 2 AR." This tells the NCS that W9QLW represents the Indiana section (QIN), and has traffic.

(3) The area net liaison station (designated beforehand by the region net manager) receives all traffic designated for the area net.

(4) Stations reporting in who are not authorized section representatives or liaisons simply indicate the traffic they have to send. If they do not have any traffic, they are immediately excused by the NCS, unless they can provide an outlet not available on the net through regular NTS channels.

(5) In the event a particular section is not represented in the region net, the NCS will use a special liaison method (see page) or any alternative channel available for clearing traffic to that section.

(6) In some cases it may be feasible to set up liaison between daytime and evening region nets. Such liaison can be useful for transferring "thru" traffic in a second session to a first session net. *Example:* The second daytime session of the Fifth Region Net receives a message destined for Chicago, which is in the Ninth Region. Normally, the message would be transferred to an evening section net to go through the evening cycle to its destination. Liaison with the early evening region net will eliminate a couple of these relays and work no hardship on the system.

(d) *Area Nets.*

(1) Stations reporting in indicate traffic by *region* if it is destined for a region within that area, by *area* if it is destined to a point outside that area. All stations reporting in with assigned receive functions indicate for which region in the area or for which other area they are authorized to receive traffic. *Example* — "WØAM DE W5GHP RN5 TX QTC 9RN 4 TEN 2 EAN 3 PAN 4 AR."

(2) The TCC representative designated to take traffic for another area so indicates in his QNI (check-in). *Example* — "K2KIR DE W1NJM PAN QRU AR." This tells the NCS, K2KIR, that W1NJM will take any traffic destined to the Pacific Area and that he himself has no traffic.

(e) *Send and Receive Stations.* Many NTS nets have adopted the procedure of sending more than one representative to the next-higher NTS echelon — one to take the traffic up and report it in, another to receive traffic from the upper echelon and bring it back. More than one transmit or receive liaison may be provided if traffic load is heavy and the personnel available is sufficient. It is perfectly permissible, and has many advantages in overload conditions, to the NCS and the net, for traffic both going and coming to be divided among two or more liaison stations.

Representatives who do not indicate which function they are performing will be assumed to be ready to perform both transmit and receive functions, at the discretion of the NCS. To indicate which you are performing, on cw send RX or TX after your QNI; on phone, say "receive only" or "transmit only," or "both."

The above procedure is not mandatory but is exemplary of what we are trying to accomplish in NTS. All net managers are urged to abide by it as closely as possible so that NTS procedure will be standard throughout the systems.

(f) *Miscellaneous.*

(1) When "QNY procedure" (dispatching stations to clear traffic on an adjacent or different frequency) is used, the station designated to *receive* traffic should call first, after zeroing on a spot near the QNY point comparatively free of QRM. When a two-way exchange is to be made, the station named first by the NCS is to call first.

(2) In QNY procedure, (which should be used whenever traffic is heavy, if possible), the frequency designated by the NCS is not intended to be exact. NTS stations using this procedure will be careful not to disrupt other traffic nets or ongoing QSOs by carelessly plopping down and starting to call on the frequency. If QRM is heavy on the spot designated by the NCS, it is expected stations will attempt to find a spot nearby on which to clear their traffic rather than returning to net frequency without having cleared it.

(3) It is not the policy for NTS nets to insist on a clear channel. Other stations operating on the frequency of an NTS net have a perfect right to be there. Net control stations should not request such stations to move. If the net frequency is occupied at net starting time, NCS should call the net on a nearby clear channel.

II — ARRL PRECEDENCES AND HANDLING INSTRUCTIONS

All messages handled by Amateur Radio should contain precedences — that is, an evaluation of each message's importance, made by the originating station. A precedence is an "order of handling." There are four precedences in the ARRL message form: Emergency, Priority (P), Welfare (W) and Routine (R), *in that order of handling.* When and as they appear on a net or any other kind of circuit, messages will be handled in this order.

EMERGENCY - Any message having life and death urgency to any person or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be *very rare.* On cw/RTTY, this designation will *always* be spelled out. When in doubt, do not use it.

PRIORITY - Use abbreviation *P* on cw/RTTY. This classification is for a) important messages having a specific time limit b) official messages not covered in the emergency category c) press dispatches and emergency-related traffic not of the *utmost* urgency d) notice of death or injury in a disaster area, personal or official.

WELFARE - This classification, abbreviated as *W* on cw/RTTY, refers to either an inquiry as to the health and welfare of an individual in the disaster area or an advisory from the disaster area that indicates all is well. Welfare traffic is handled only after all emergency and priority traffic is cleared. The Red Cross equivalent to an incoming Welfare message is DWI (Disaster Welfare Inquiry).

ROUTINE - Most traffic in normal times will bear this designation. In disaster situations, traffic labeled Routine (*R* on cw/RTTY) should be handled last, or not at all when circuits are busy with higher precedence traffic.

The precedence will follow, *but is not a part of,* the message number. For example, a message may begin with NR 207 R on cw, "Number Two Zero Seven, Routine" on phone.

Handling instructions (HX) are less-used but quite useful in handling messages. They serve to convey any special instructions to handling and delivering operators. This "prosign," when used, is inserted in the message preamble between the precedence and the station of origin. Its use is *optional* with the originating stations, but once inserted is *mandatory* with all relaying stations. The following definitions apply:

HXA — (Followed by number.) Collect landline delivery authorized by addressee within miles. (If no number, authorization is unlimited.)

HXB — (Followed by number.) Cancel message if not delivered within . . . hours of filing time; service originating station.

HXC — Report date and time of delivery (TOD) to originating station.

HXD — Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.

HXE — Delivering station get reply from addressee, originate message back.

HXF — (Followed by number.) Hold delivery until . . . (date).

HXG — Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.

Example: NR 207 R HXA50 W4MLE 12 . . . (etc.).

If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated thus: NR 207 R HXAC W4MLE . . . (etc.) But NR207 R HXA50 HXC W4MLE . . . (etc.). One phone, use phonetics for the letter or letters following the HX, to insure accuracy.

III — OPERATION OF THE TRANSCONTINENTAL CORPS

The purpose of the Transcontinental Corps (TCC) is to relay traffic from one NTS area to another, conducting liaison with NTS area nets to do so. Administratively, the TCC is divided into Cycle Two and Cycle Four functions, and each cycle has specific functionaries under the supervision of a TCC director.

The function of the TCC director is to assign functions, centralize activity and file

status reports each month to ARRL headquarters. There are six TCC directors, two for each area.

TCC functions are performed in several ways, according to circumstances. In all but two cases, the method used is an out-of-net schedule between TCC counterparts of different areas to effect the exchange of traffic from area to another. The exceptions are Station A and L; these stations report directly into the Central Area Net with traffic from the Eastern Area to the Central Area, since there is no time between these two area net meetings for an out-of-net schedule.

Times and frequencies of the other 20 schedules are worked out by the TCC directors working together and are arranged in accordance with time available, propagation conditions, stations available and other factors, always with the objective of the best service possible on an organized, systematic basis.

TCC stations must have the following qualifications: (1) Adequate signal power to perform the job to be done; normally inputs of under 100 watts can not accomplish it unless a very efficient antenna system is used. (2) The highest caliber of operating ability and NTS net savvy. (3) Capability both personally and equipment-wise to keep the required schedules.

A TCC station normally performs only one TCC function per week. On other days of the week, other stations perform the same function. TCC operates on a seven-day-per-week basis. Each function consists of two steps, as follows (all times in UTC):

Station Function

A. 1. Normally located in the *Eastern* Area, this station reports into Eastern Area Net (EAN) at 0130, receives all traffic for Central Area (CAN).
   2. Reports into Central Area Net (CAN) the same night at 0230, distributes the traffic upon direction of the CAN control station.

B. 1. Normally located in the *Eastern* Area, this station reports into Eastern Area Net (EAN) at 0130, receives all traffic for the Pacific Area (PAN).
   2. Keeps a schedule with *Station H* some time between 0230 and 0430 and sends this traffic to him.

C. 1. Normally located in the *Central* Area, reports into Central Area Net (CAN) at 0230, takes all traffic for the Eastern Area (EAN).
   2. Keeps a schedule with *Station K* some time after 0330 and sends this traffic to him.

D. 1. Normally located in the *Eastern* Area, this station keeps a schedule with *Station J* some time between 0530 and 1930 to receive traffic for the Eastern Area.
   2. Sends this traffic into destination Section, Region or the Eastern Area Net (EAN) at first opportunity.

E. 1. Normally located in the *Central* Area, this station reports into Central Area Net (CAN) at 0230, receives all traffic for Pacific Area (PAN).
   2. Keeps a schedule with *Station G* between 0330 and 0430 and sends this traffic to him.

F. 1. Normally located in the *Central* Area, this station keeps a schedule with *Station I* between 0530 and 2030 to receive for the Central Area.
   2. Sends this traffic into destination Section, Region or the Central Area Net as soon as possible after received.

G. 1. Normally located in the *Pacific* Area, this station keeps a schedule with *Station E* between 0330 and 0430 to receive traffic for the Pacific Area (PAN).
   2. Reports into the Pacific Area Net (PAN) at 0430 to distribute this traffic under direction of the PAN control station.

H. 1. Normally located in the *Pacific* Area, this station keeps a schedule with *Station B* between 0230 and 0430 to receive traffic for Pacific Area (PAN).
   2. Reports into the Pacific Area Net at 0430 to distribute this traffic under direction of the PAN control station.

I. 1. Normally located in the *Pacific* Area, this station reports into the Pacific Area Net (PAN) at 0430 to receive traffic for the Central Area (CAN).
   2. Keeps a schedule with *Station F* between 0530 and 2030 to send this traffic.

J. 1. Normally located in the *Pacific* Area, this station reports into the Pacific Area Net (PAN) at 0430 to receive traffic for the Eastern Area (EAN).
   2. Keeps a schedule with *Station D* between 0530 and 1930 to send this traffic.

K. 1. Normally located in the *Eastern* Area, this station keeps a schedule with *Station C* between 0330 and 1930 to receive traffic for Eastern Area (EAN).

2. Sends this traffic into destination Section, Region or the Eastern Area Net as soon as possible after received.

L. 1. Normally located in the *Eastern* Area, this station reports into Eastern Area Net (EAN) at 1930, receives all traffic for Central Area (CAN).
2. Reports into Central Area Net (CAN) at 2030, distributes the traffic upon direction of the CAN control station.

M. 1. Normally located in the *Eastern* Area, this station reports into Eastern Area Net (EAN) at 1930, receives all traffic for the Pacific Area (PAN).
2. Keeps a schedule with *Station S* some time between 2030 and 2230 and sends this traffic to him.

N. 1. Normally located in the *Central* Area, reports into Central Area Net (CAN) at 2030, takes all traffic for the Eastern Area (EAN).
2. Keeps a schedule with *Station V* some time after 2130 and sends this traffic to him.

O. 1. Normally located in the *Eastern* Area, this station keeps a schedule with *Station U* some time between 2330 and 0130 to receive traffic for the Eastern Area.
2. Sends this traffic into destination Section, Region or the Eastern Area Net (EAN) at first opportunity.

P. 1. Normally located in the *Central* Area, this station reports into Central Area Net (CAN) at 2030, receives all traffic for Pacific Area (PAN).
2. Keeps a schedule with *Station R* between 2130 and 2230 and sends this traffic to him.

Q. 1. Normally located in the *Central* Area, this station keeps a schedule with *Station T* between 2330 and 0230 to receive traffic for the Central Area.
2. Sends this traffic into destination Section, Region or the Central Area Net as soon as possible after received.

R. 1. Normally located in the *Pacific* Area, this station keeps a schedule with *Station P* between 2130 and 2230.
2. Reports into the Pacific Area Net (PAN) at 2230 to distribute this traffic under the direction of the PAN control station.

S. 1. Normally located in the *Pacific* Area, this station keeps a schedule with *Station M* between 2030 and 2230 to receive traffic for Pacific Area (PAN).
2. Reports into the Pacific Area Net at 2230 to distribute this traffic under the direction of the PAN control station.

T. 1. Normally located in the *Pacific* Area, this station reports into the Pacific Area Net (PAN) at 2230 to receive traffic for the Central Area (CAN).
2. Keeps a schedule with *Station Q* between 2330 and 0230 to send this traffic.

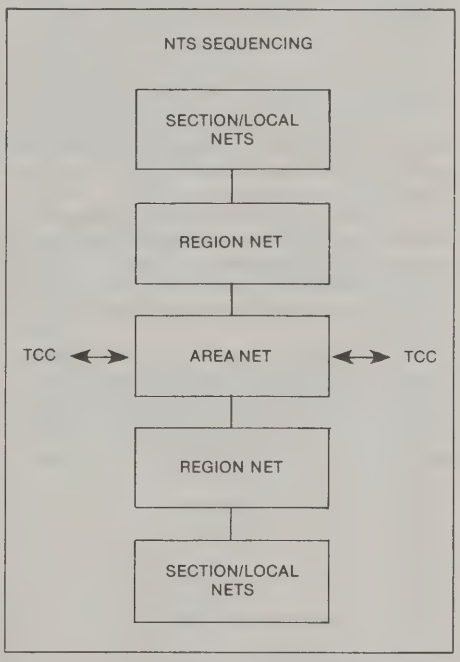

Fig. 8 — Block Diagram of NTS Sequencing

U. 1. Normally located in the *Pacific* Area, this station reports into the Pacific Area Net (PAN) at 2230 to receive traffic for the Eastern Area (EAN).
2. Keeps a schedule with *Station O* between 2330 and 0130 to send this traffic.

V. 1. Normally located in the *Eastern* Area, this station keeps a schedule with *Station N* between 2130 and 0130 to receive traffic for Eastern Area (EAN).
2. Sends this traffic into destination Section, Region or the Eastern Area Net as soon as possible after received.

Functions A, B, C, E, G, H, I, J, O, Q, V, have been assigned to the Cycle Four TCC director, while Functions D, F, K, L, M, N, P, R, S, T, U, have been designated the responsibility of the Cycle Two TCC director.

The following is an example to show how traffic is or can be routed on the National Traffic System. In each case, perfect (ideal) operating conditions and 100% adherence to system as previously outlined are assumed.

(a) This example demonstrates how a message originating in South Carolina finds its way to Los Angeles in the evening cycle. K4ZB is an amateur in South Carolina who has been asked to originate a message to Los Angeles. All times are UTC, assuming local standard time is being observed throughout.

(1) W4ABC reports the message into the South Carolina Section Net at 0000 and transmits it to W4ANK, the station designated to take traffic to 4RN.

(2) W4ANK takes the message to 4RN at 0045, gives it to KB4N, the station designated to take traffic to EAN.

(3) KB4N reports the message into EAN at 0130, gives it to W3PQ, who is TCC Station B.

(4) W3PQ keeps a TCC out-of-net schedule with N6WP (TCC Station H) and sends him the message. This is a transcontinental hop, but the two stations involved may pick any frequency or mode in any band. The exchange must have been completed by 0430, when PAN meets.

(5) N6WP reports the message into PAN at 0430, gives it to W6JXK, the RN6 (receive) representative.

(6) W6JXK reports the message into RN6 at 0530, gives it to W6INH, the Los Angeles Section representative.

(7) W6INH reports it into Southern Calif. Net at 0600, gives it to K6INK, the Los Angeles station nearest the destination.

(8) K6INK can telephone or otherwise deliver the message to the addressee upon receipt. The message originated in South Carolina at 0000, was delivered in LA at about 0630.

In addition to the NTS routing system, wide-coverage independent nets, independent regions nets (covering more than one section) and direct connections to key cities in foreign countries are also available. These key cities, usually accessed through the independent nets, have been especially valuable in assisting emergency communications in Central and South America. The independent nets take on a wide variety of types and forms with many of the most ac-

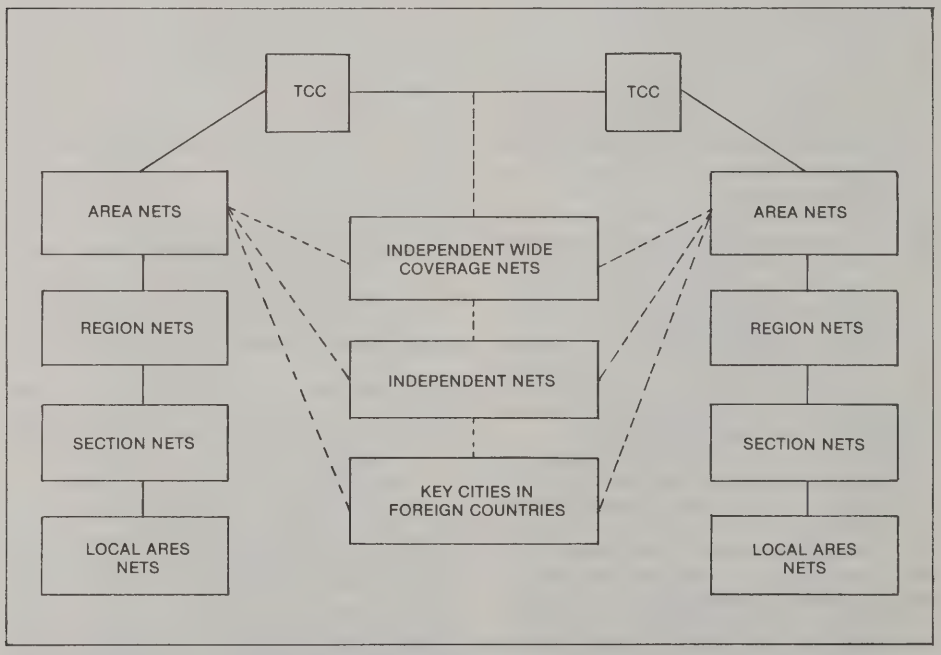

Fig. 9 — Emergency communications through linked nets.

tive heard daily on 40 and 20 meters. The 20-meter nets are especially important in covering the areas of the Caribbean and South America.

Fig. 9 shows the traffic reaching these independent nets through the higher levels of NTS, i.e. from liaison out of either the area nets or TCC. The reasoning for this is simply that stations who operate in the area nets and in TCC have the most "savvy" and experience. They know which nets meet when and the best modes of routing traffic into or out of certain areas. Further, in times of emergency, the net managers at this level maintain contact with ARRL hq. and are thus aware of any special arrangements that have been made regarding traffic routing.

V — COUNTING NET TRAFFIC

The basic count for traffic handled in nets is one point for each time a message in standard ARRL form is *transmitted and received* during a net session, at the direction of the net control station. This has nothing to do with the individual station traffic count. In a net count there is no breakdown of originated, received, sent and delivered traffic as there is for individual stations. The count is the number of message *handlings* accomplished during the net's directed sessions.

This is simple enough, yet there seems to be considerable confusion about it. A few examples may be helpful:

Example 1: Upon conclusion of his directed net, a NCS operator finds that there were 23 messages reported into the net and that 20 of these were "cleared" — that is, at his direction transmitted by the station holding them and receipted for by the station receiving them. The "net" traffic count for this net session was therefore 20. It makes no difference to the net count whether the messages were originals with the transmitting station, whether he is relaying them, whether they are addressed to the receiving station, delivered by the latter or relayed by him. All the net is concerned with is *handling* them, from one station to the other. Note that the net does not get credit for traffic reported, only for traffic *cleared.*

Example 2: Net control must base his count on the figures reported to him by net stations. Thus, if a station reporting into the net says he has five messages and later succeeds in clearing them at net control's direction, the net gets credit for handling five messages. However, suppose net control dispatches this station and the station to receive the messages to a side frequency to clear them, then closes the net five minutes later. How does he know whether the traffic was successfully cleared, or *how many* were cleared.

Well, he doesn't, unless he checks; if so, he can enter the exact count. Otherwise, knowing the ability of the two operators concerned, he can *estimate* what proportion of the traffic was cleared. It is not considered ethical to QNY large amounts of traffic just prior to closing a net and counting all such traffic as having been cleared during QND.

Example 3: "Book" messages should be reported into the net *not* as books, but in accordance with the count they will earn when handled. Thus a book of four messages is reported in not as "QTC book of 4," but as "QTC 2," followed by the destination. This assumes that they are all to be sent to the same station. If they are to be sent to different stations, the "book" should be broken down and the resulting separate messages reported in as such rather than as books.

Don't waste valuable net time fussing about the count. The important thing is to get the traffic handled!

VI — INDIVIDUAL TRAFFIC COUNT

As already mentioned, the individual's traffic count does not have any correlation to the net's traffic count; it is a separate count that each traffic handler should report to his/her SCM (see page 8, any *QST*) each month. Traffic totals are included in the SCM's monthly report to ARRL headquarters, which is published in *QST* under the heading of "Section Activities." Here are the definitions of each message category:

Originated — One point for each message from a third party for sending via your station. This "extra" credit is given for an off-the-air function because of the value of contact with the general public.

Sent — Every message sent over the air from your station to another amateur receives a point in this category. Thus, a message that is eligible for an *Originated* point as above receives another point when it is sent on the air. Likewise, a message that is received on the air gets a *Sent* point when it is relayed to another station. A message that you initiate yourself, while it gets no *Originated* point, gets a *Sent* point when cleared. All *Sent* points require on-the-air sending.

Received — A message received over the air gets a *Received* point, whether received for relaying (sending) or for delivery to the addressee. Any message received which is *not* eligible for a *Delivery* point (such as one addressed to yourself) is nevertheless eligible for a *Received* point.

Delivered — The act of delivery of a message to a third party receives a point in this category, in addition to a *Received* point. This is strictly an *off-the-air* function and must be coupled with receipt of the message at your station. Thus you can't get a *Delivered* point unless you first get a *Received* point.

VII — SECTION LEADERSHIP JOB DESCRIPTIONS

The section communications manager (SCM), who is elected by the ARRL members in the section, makes all section-level leadership appointments. Your SCM's name, address and phone number appear on page 8 of every issue of *QST*, for those wishing to volunteer for one of these important positions. Here is a description of the responsibilities of the SEC, STM, DEC and EC:

SEC — There is only one section emergency coordinator appointed in each section. His/her duties are

1) To encourage all groups of community amateurs to establish a local emergency organization.

2) To recommend to the SCM action on all section emergency policy and planning, including the development of a section emergency-communications plan.

3) To cooperate and coordinate with the section traffic manager so that emergency nets and traffic nets in the section present a united public-service front.

4) To recommend to the SCM candidates for emergency coordinator and district emergency coordinator appointments (and cancellations), and determination of areas of jurisdiction of each amateur so appointed. Note that the SEC does not make (or cancel) appointments; he or she simply recommends them to the SCM.

5) To promote ARES membership drives, meetings, activities, tests, procedures, etc., at the section level.

6) To collect and consolidate emergency coordinator (or district emergency coordinator) monthly reports and submit monthly progress summaries to ARRL headquarters.

7) To maintain contact with other communications services and liaison at the section level with all agencies served in the public interest, particularly in connection with state and local government, civil defense, Red Cross, Salvation Army and the National Weather Service.

8) Full ARRL membership and a general class license (Amateur Grade in Canada) or higher required.

STM — There is only one section traffic manager appointed for each section. His/her duties are as follows:

1. Establishment, administration and promotion of a traffic-handling program at the section level.

2. Cooperation and coordination with the section emergency coordinator so that traffic nets and emergency nets in the section present a united public service front.

3. Recommendations of candidates for net manager to the SCM.

4. Ability and familiarity with proper traffic handling procedures in two or more different modes.

5. Collection of net manager monthly reports for submission to ARRL headquarters.

6. Full ARRL membership and a General class license (Amateur Grade in Canada) or higher required.

DEC — The district emergency coordinator is appointed by the SCM, in concert with the SEC, to supervise a district of EC jurisdictional units. The duties of the DEC are to

1) Coordinate the training, organization and emergency participation of emergency coordinators in the area of jurisdiction.

2) Make local decisions in the absence of the SEC or through coordination with the SEC concerning the allotment of available

amateurs and equipment during an emergency.

3) Coordinate the interrelationship between local emergency plans and between communications networks within the area of jurisdiction.

4) Act as backup for local areas without an emergency coordinator and assist in maintaining contact with governmental and other agencies in the area of jurisdiction.

5) Provide direction in the routing and handling of emergency communications of either a formal or tactical nature.

6) Recommend EC appointments to the SEC and SCM and advise on OES appointments.

7) Coordinate the reporting and documentation of ARES activities in the area of jurisdiction.

8) Act as a model emergency communicator as evidenced by dedication to purpose, reliability and understanding of emergency communications.

The local emergency coordinator (EC) is in charge of a smaller geographical area than the DEC. The responsibilities of an EC are to

1) Coordinate the training, organization and emergency participation of interested amateurs in the area of jurisdiction.

2) Establish an emergency-communications plan for the area that will effectively utilize the group to cover the needs for both tactical and formal message traffic requirements.

3) Establish a viable working relationship with governmental and other agencies who might need the service of ARES (e.g., Red Cross, Salvation Army, Rescue Squads, Weather Service, Hospitals, Police Department and Fire Department).

4) Establish local communications networks run on a regular basis and periodically test these networks by drills.

5) Establish an emergency traffic plan utilizing NTS to the extent possible and coordinate liaison with NTS nets.

6) In times of disaster, evaluate the communications needs of the jurisdiction and respond quickly to those needs.

7) Do all that is possible to further the image of Amateur Radio by dedication to purpose, reliability and a thorough understanding of the mission of Amateur Radio.

VIII — UNITED STATES AND CANADA THIRD-PARTY TRAFFIC AGREEMENTS

THIRD-PARTY TRAFFIC AGREEMENTS

The United States has made special arrangements to permit U.S. amateurs to exchange third-party traffic with amateurs licensed by any of these 28 other countries:

North America: Canada, Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama.

South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela.

Europe: 4UIITU — Geneva

Asia: Israel, Jordan

Africa: Ghana, Liberia

Canada has made special arrangements to permit Canadian amateurs to exchange third-party traffic with amateurs licensed by any of these 19 countries:

North America: Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, United States

South America: Bolivia, Chile, Colombia, Guyana, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela

Europe: No countries.

Asia: Israel

Africa: No countries

State/Province	*Abbrev.*	*Region*	*Area*
Alaska	AK	7	PAN
Alabama	AL	5	CAN
Alberta	AB	7	PAN
Arizona	AZ	12	PAN
Arkansas	AR	5	CAN
British Columbia	BC	7	PAN
California	CA	6	PAN
Colorado	CO	12	PAN
Connecticut	CT	1	EAN
Delaware	DE	3	EAN
District of Columbia	DC	3	EAN
Florida	FL	4	EAN
Georgia	GA	4	EAN
Guam	GU	6	PAN
Hawaii	HI	6	PAN
Idaho	ID	7	PAN
Illinois	IL	9	CAN
Indiana	IN	9	CAN
Iowa	IA	10	CAN
Kansas	KS	10	CAN
Kentucky	KY	9	CAN
Labrador	LB	11	EAN
Louisiana	LA	5	CAN
Maine	ME	1	EAN
Manitoba	MB	10	CAN
Maryland	MD	3	EAN
Massachusetts	MA	1	EAN
Michigan	MI	8	EAN
Minnesota	MN	10	CAN
Mississippi	MS	5	CAN
Missouri	MO	10	CAN
Montana	MT	7	PAN
Nebraska	NE	10	CAN
Nevada	NV	6	PAN
New Brunswick	NB	11	EAN
New Hampshire	NH	1	EAN
New Jersey	NJ	2	EAN
New Mexico	NM	12	PAN
New York	NY	2	EAN
Newfoundland	NF	11	EAN
North Carolina	NC	4	EAN
North Dakota	ND	10	CAN
Nova Scotia	NS	11	EAN
Ohio	OH	8	EAN
Oklahoma	OK	5	CAN
Ontario	ON	11	EAN
Oregon	OR	7	PAN
Pennsylvania	PA	3	EAN
Prince Edward Island	PE	11	EAN
Puerto Rico	PR	4	EAN
Quebec	PQ	11	EAN
Rhode Island	RI	1	EAN
Saskatchewan	SK	10	CAN
South Carolina	SC	4	EAN
South Dakota	SD	10	CAN
Tennessee	TN	5	CAN
Texas	TX	5	CAN
Utah	UT	12	PAN
Vermont	VT	1	EAN
Virginia	VA	4	EAN
Virgin Islands	VI	4	EAN
Washington	WA	7	PAN
West Virginia	WV	8	EAN
Wisconsin	WI	9	CAN
Wyoming	WY	12	PAN
APO New York	APO NY	2	EAN
APO San Francisco	APO SF	6	PAN

W1AW

ARRL operates a Headquarters station using W1AW, the original call of its founding father, Hiram Percy Maxim; thus, it is often known as the Maxim Memorial Station. Many services are performed for the operating amateur over W1AW every day, including bulletins of information and latest news, code practice at speeds from 5 through 35 wpm, and certificate-qualifying runs, frequency measuring transmissions, etc. The complete W1AW operating schedule appears in April and October *QST*, and is also available on request from Headquarters with an s.a.s.e. Ask for CD-5.

IN A COMMUNICATIONS EMERGENCY

monitor W1AW for bulletins as follows: *Phone*, on the hour. *RTTY*, 15 minutes past the hour. *Cw*, on the half hour.

TIME CONVERSION TO UTC

EST	*UTC*	*CST*	*MST*	*UTC*	*PST*
1900	0000*	1800	1700	0000*	1600
2000	0100	1900	1800	0100	1700
2100	0200	2000	1900	0200	1800
2200	0300	2100	2000	0300	1900
2300	0400	2200	2100	0400	2000
0000*	0500	2300	2200	0500	2100
0100	0600	0000*	2300	0600	2200
0200	0700	0100	0000*	0700	2300
0300	0800	0200	0100	0800	0000*
0400	0900	0300	0200	0900	0100
0500	1000	0400	0300	1000	0200
0600	1100	0500	0400	1100	0300
0700	1200	0600	0500	1200	0400
0800	1300	0700	0600	1300	0500
0900	1400	0800	0700	1400	0600
1000	1500	0900	0800	1500	0700
1100	1600	1000	0900	1600	0800
1200	1700	1100	1000	1700	0900
1300	1800	1200	1100	1800	1000
1400	1900	1300	1200	1900	1100
1500	2000	1400	1300	2000	1200
1600	2100	1500	1400	2100	1300
1700	2200	1600	1500	2200	1400
1800	2300	1700	1600	2300	1500

Universal Coordinated Time (UTC) is the time at the zero or reference meridian. Time changes one hour with each change of 15° in longitude. EST, CST, MST and PST are 5, 6, 7 and 8 hours "earlier" than the time at the reference (0°) meridian. They correspond to 75th, 90th, 105th and 120th meridians.

* or 2400. (2400 is associated with the date of the day ending 0000 with the day just starting.)

Name: _____ Call: _____

AMATEUR RADIO EMERGENCY SERVICE

REGISTRATION FORM

Address: _____

City: _____ State/Prov.: _____ Zip/PC: _____

Bus. phone: _____ Home phone: _____ County: _____

License Class: _____ Primary radio interest: _____

Check (✓) bands/modes you can operate:

	160	80	40	20	15	10	6	2
CW								
FM								
RTTY								
SSB								
MOBILE								

Can your home station operate without commercial power& ( ) YES ( ) NO

If yes, what bands? _____

Signed: _____ Date: _____

PUBLIC SERVICE COMMUNICATIONS MANUAL

PUBLISHED BY
the American Radio Relay League, Inc.

HEADQUARTERS
225 MAIN STREET, NEWINGTON, CT., U.S.A. 06111

Foreword

Public service communication has been a traditional responsibility of the Amateur Radio Service since 1913, when the first known emergency communication was conducted by an amateur. In today's Amateur Radio, it is a highly organized and very worthwhile part of day-to-day operation, implemented principally through the Amateur Radio Emergency Service (ARES), and the National Traffic System (NTS), sponsored by ARRL. The Radio Amateur Civil Emergency Service (RACES) and other amateur public service groups are also a part of ARRL-recognized Amateur Radio public service efforts.

The ARES now consists of approximately 70,000 licensed amateurs who have registered their availability for emergency operation in the public interest. Its operational leadership consists of local, district and section emergency coordinators appointed by elected administrative officials at ARRL section level called section communications managers. There are approximately 1700 emergency coordinators.

NTS is a daily-operating organization for handling medium and long-distance written traffic in standard form. It consists of nets at four levels, with lines of liaison connecting them for the systematic flow of message traffic from point of origin to point of delivery in the shortest possible time consistent with organizational training objectives and mass handlings. Its leaders are appointed either by the SCM or by the ARRL Communications Manager, depending on the level of the net in question.

A separate sub-part of the U.S. amateur regulations (Part 97, sub-part F), provides for the Radio Amateur Civil Emergency Service. RACES is a special phase of amateur operation sponsored by the Federal Emergency Management Agency, and applies to U.S. amateurs only. Its primary purpose is to provide amateurs with a special opportunity to serve governmental civil preparedness agencies.

This edition of the PSCM, revised by Assistant Communications Manager Robert Halprin, K1XA, constitutes (along with the ARRL pamphlet *Operating An Amateur Radio Station*) the most authoritative source of information on the League's public service communications program. The Appendix will provide additional operational details not covered in the rest of the booklet.

John F. Lindholm, W1XX
Communications Manager, ARRL

CD-235 (181)

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DISTRESS CALLING

For many years, ARRL had its own distress calling signals and procedures, often called the "land SOS." First this was QRR; later, when QRR was adopted internationally with a different meaning, we used QRRR, and still later "CQ Emergency" was adopted as the equivalent of QRRR on phone.

Recently the preferences of amateurs have changed, and both QRRR and "CQ Emergency" have been abandoned. Indeed, they were seldom if ever used. Amateurs are henceforth bound by the use of international distress and urgency signals. In a dire emergency situation, use SOS by Morse Code, "MAYDAY" by voice.

International regulations for distress calling and answering are far too lengthy to reproduce here. The logical place for a distress call is on an established net or other calling or emergency frequency. The SOS or "MAYDAY" call should be electrifying in stopping all operation in its tracks. Should you hear such a signal, QRT! Not until you have received the complete emergency message should you transmit, and then only if you have some reason to believe you can be of assistance. In most cases, someone nearer than you will be better able to handle it.

Any distress call, especially if transmitted "blind," should contain details such as (1) location of the emergency, (2) nature of distress and (3) type of assistance required, in addition to any other information which would enable a listener to more promptly render assistance.

DO NOT USE SOS OR MAYDAY unless emergency assistance is required! There are severe penalties for using these signals without sufficient justification.

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I — PUBLIC SERVICE

Amateur Radio exists because it qualifies as a service. Throughout our history, we amateurs have established a reputation for public service communications which is of the greatest importance to our continued occupation of frequencies. At first this service was rendered spontaneously and on an individual basis. As time progressed, the need for and value of organization became evident, resulting in the establishment of organized trunk lines and net systems and later of the Amateur Radio Emergency Service and the National Traffic System.

Today there exists in Amateur Radio a very complete and very tight volunteer organization of amateur operators for public service. Sponsored by ARRL, this field organization includes the combined facilities of the Amateur Radio Emergency Service, as it has developed since 1935, the National Traffic System as it has developed since 1949 and recognizes the Radio Amateur Civil Emergency Services (RACES) and independently-organized amateur facilities as integral parts of the Amateur Service's public service effort. These initials (ARES, NTS and RACES) and others to be introduced subsequently will occur frequently throughout this booklet.

II — THE ARRL FIELD ORGANIZATION

It is significant that Part 97 of the FCC's Rules and Regulations mentions, as the very first principle under "Basis and Purpose," the following: "(a) Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications." ARES and NTS exist as the League's implementation of this basic principle for the basis and purpose of our fraternity. ARES and NTS have much in common. Every emergency net is bound to be, to some extent, a traffic net, and every traffic net should be prepared to take on emergency duties. Emergency-conscious and traffic-conscious operators have this in common: they both derive their chief pleasure out of activities which are directly beneficial not only to Amateur Radio but also to their community and to their country.

Basic Organization and Functions

The diagram of Figure 1 will give a general idea of how the field organization is structured. While a really graphic portrayal is difficult, one can, from the diagram, get some idea how ARES and NTS tie together at top and bottom. Most ARES nets exist only at the local level, and are tied into NTS at section (usually state) level for integration into the national system. The divisions are again tied together at ARRL headquarters by a common centralizing setup in the ARRL Communications Department.

Leadership in the emergency division (ARES) is exercised by the section emergency coordinator and the district and local ECs, as shown; in the traffic division (NTS) by net managers at various levels, at the section level by section traffic managers and net managers. The SCM makes all section-level leadership and station appointments. For more information on station appointments, see *Operating An Amateur Radio Station.*

Usually, emergency operation is initiated at the local level and is the business of the ARES emergency coordinator. Even if the emergency situation transcends local and becomes of statewide, or regional, or even of national concern, the situation and what to do about it are primarily the concern of ARES officials. Communications concerning it would be generated by civic and welfare officials, or at their behest, and resulting problems handed to the ARES for solution.

While ARES and NTS are the ARRL's public service organizations, it should not be concluded that this is all there is to Amateur Radio public service or that this is the extent of the League's interest in it. On the contrary, there are many other amateur public service operating groups under different sponsorship which are a vital part of the public service function of the amateur. As such, they merit and receive the League's recognition and assistance to the extent desired and feasible.

One of them, the Radio Amateur Civil Emergency Service (RACES) is sponsored by the Federal Emergency Management Agency, and implemented at various levels of civil preparedness. Since it is permanently established as a branch of the amateur service under Part F of the amateur regulations, some of the details of its operation will be in-

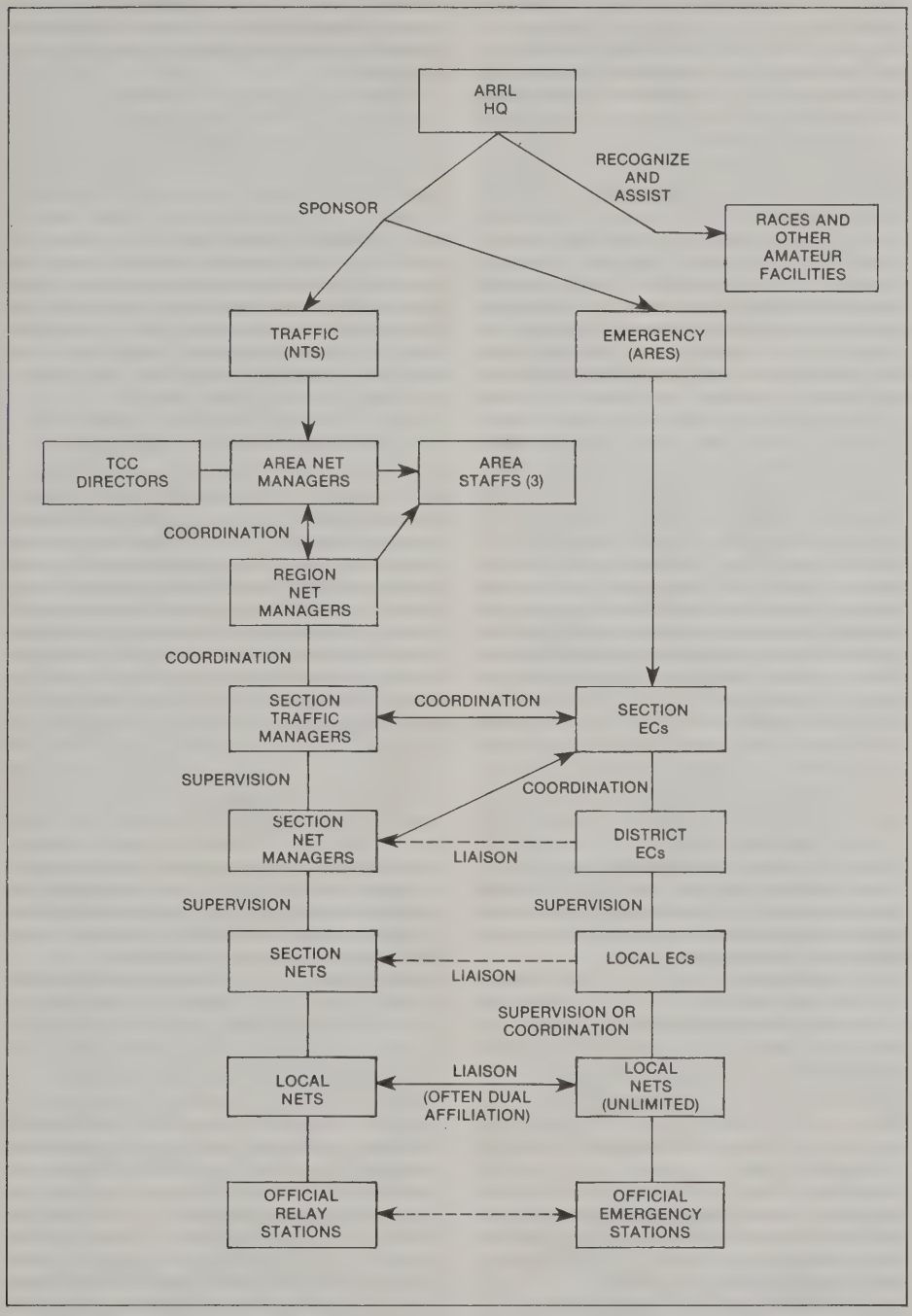

Fig. 1 - ARRL Field Organization Diagram

cluded in this publication (Part IV). Others, sponsored by other government agencies or organized and operated by amateurs outside the ARRL sphere, are more transitory in nature or not fully amateur-oriented and will be covered in *QST* magazine in accordance with current activities.

The details of the internal workings of ARES and NTS will come in for further discussion later in this booklet. Our primary topic at the present instance is that part of the setup which couples together these two divisions. This involves closely-planned liaison between them so that both in normal times and during an emergency there can be a singleness of operation and purpose. Thus, the ARES which previously considered only emergency operation, now takes on some regular-operation duties while NTS, which usually operated only routinely, now takes on some emergency-operation duties.

Normal Operation. During its every-day operation, NTS normally completes two "cycles," one during the daytime hours and one in the evening. The cycle goes from section to region to area, and back down through region and section. Special transcontinental facilities are used during both cycles to shuttle traffic among the three NTS areas. The sequence of each cycle occurs *every* day, including week ends and holidays.

There is one other echelon of NTS nets, called local nets. Such nets include those organized at city, community or county level for the purpose of handling and delivering traffic within such boundaries, even though in many cases such traffic could be delivered by landline without toll charge. This is called "neighborhood delivery" and is a valuable training phase of NTS operation which would be most useful in the event of a local communications emergency.

The establishment of this "local" echelon of NTS brings into the NTS picture hundreds of ARES nets which hold only occasional drills and which are intended to operate mainly during emergencies. If they operate at least once per week *regularly* and maintain liaison with their section NTS net, any message traffic received through the system for delivery may be routed to the point closest to delivery in the local net. The very important liaison function will require stations with considerable versatility, because most section nets operate on 80/75 meters while most local nets use VHF.

Local ARES nets are encouraged to take on regular traffic-handling functions by making liaison with NTS, and thus becoming local NTS nets. There is nothing like regular message-handling in normal times to prepare a group for team operation in an emergency situation.

Emergency Operation. For the ARES, the emergency is the culmination of all its preparatory efforts; for NTS, it is an intensive interlude in its daily operations. When an emergency situation arises, the usual procedure is for an official of a served agency (e.g., the Red Cross) to notify a representative of the amateur service (e.g., the emergency coordinator, with whom he should have had previous contact) of specific requirements for emergency communication. The EC then alerts the ARES unit via whatever prearrangements they have made and sets up the required circuits.

Such a system has worked adequately in the past for local communications purposes, but medium and long distance requirements, when needed, have usually been set up spontaneously and have shown the need for advance planning. Then NTS takes on an emergency-operation complexion for the express purpose of handling medium- and long-distance traffic. This is done by activation of certain NTS nets, as required, at section, region or area level, and of the Transcontinental Corps (TCC), depending on the extent of the emergency and the communications needs. Such activation is accomplished primarily on the initiative of the ARES official concerned, who is the man on the scene who perceives the need. In the case of a local-type emergency, the EC has ready access to the NTS section net, manager, and, if needed, he can request net activation on an emergency basis. Via this net he can also request activation of adjacent ARES nets or their participation with his group to extend local coverage if this seems indicated.

On recommendation of an SEC or STM, or at the request of a section net manager, the NTS region net might also be activated; and when or if inter-regional traffic exists, an NTS area net might be activated at the request of a region net manager.

In the final analysis, which nets are activated, to what extent, on what basis, are matters determined by ARRL officials acting together to set up the system to be used for that particular emergency. In order that this kind of coordination will work with a minimum of confusion and conflict, these amateur officials must keep in touch with and be known to each other in the normal course. Come the need, they will have established pre-arranged methods of con-

tacting each other by radio. Such methods may entail use of established nets, one or more established calling and emergency frequencies or some other mutually-agreed-upon means. Of course landline can be used if available, but should not be depended upon.

Hot Lines. During an emergency situation there occasionally develops a need for a special circuit covering two points between which high precedence traffic is heavy. Where such a need occurs between points within a section, the special circuit can be set up by the section-net manager, STM or the SEC. Where it involves points in different sections in the same region, the NTS region net manager is responsible. Where the two points are in different regions but the same area, the area net manager would make the arrangements. And where the two points are in different areas, the TCC director assigns two of his functionaries to the task. Such special circuits are called "hot lines," set up *only* when there is enough high-precedence emergency traffic to keep them busy, and are discontinued promptly when such a condition ceases to exist.

Very few emergencies and emergency situations are predictable from a national standpoint. League officials, whether their principal activity is in the ARES or NTS sphere, must have freedom of action and movement within a set of general principles, the latter being for the purpose of guiding them, not restricting them. What nets should be activated in a given situation, how often the NTS cycle should operate, what special circuits need to be set up and how this best can be done — all these are matters that have to be decided as the situation develops, by SECs, STMs, ECs and NTS net managers on the scene best qualified to decide them.

The general principles are these: (1) NTS nets will be activated in accordance with the emergency situation by their respective managers at the request of ARES officials, and (2) special inter-section circuits will be set up by National Traffic System net managers — to handle such emergency-precedence traffic as or if the need for them develops. The detailed procedure may vary considerably from place to place.

Advisory Committees

The ARRL Board of Directors has established a number of advisory committees. These committees are composed of qualified amateurs with the function of undertaking studies, reviewing proposals and communicating advice, recommendations and expertise from the League's membership to its management in various specialty areas of Amateur Radio. One of these areas is emergency communications and one of the advisory committees is the Emergency Communications Advisory Committee (ECAC).

The ECAC consists of a qualified amateur from each of the ten U.S. call areas and one from Canada. Its members are appointed by the ARRL president, who names one of them chairman. A director, vice director or an elected officer is named by the president to act as a point of contact between the committee and the Board of Directors, and a member of the Headquarters staff is similarly designated to serve such a function between the committee and the headquarters.

While there is no similar advisory committee advising on NTS matters, the communications manager many years ago set up NTS Area Staffs, one in each of the three NTS areas -- Eastern, Central and Pacific. Each Area Staff consists of the region net managers, area net managers, TCC directors and three "members at large" elected by the other members. Each Area Staff also elects a chairman. In-person meetings are called by the chairman whenever in his judgment there are sufficient agenda items to make such a meeting worthwhile. NTS officials at region, area and TCC level are also authorized certain travel within their specific areas of jurisdiction to accomplish specific NTS objectives.

All of these advisory groups -- the ECAC and the three NTS Area Staffs -- have contributed greatly to the input of information and expertise on public service matters, including no little contribution to the current revision of this booklet.

III — AMATEUR RADIO EMERGENCY SERVICE

The Amateur Radio Emergency Service consists of licensed amateurs who have voluntarily registered their qualifications and equipment for communication duty in the public service when disaster strikes. Every licensed amateur, whether or not a member of ARRL or any other local or national organization, is eligible for membership in the ARES. The only qualification other than holding a license is a sincere desire

to serve. Since ARES is an amateur service, *only* amateurs are eligible for membership. *The possession of emergency-powered equipment is desirable, but is not a requirement for membership.*

Principles of Emergency Communication

It is impossible to state exact rules to try to cover *every* situation that will arise. The good average amateur faced with an emergency situation may, however, benefit greatly from certain rules of thumb. These rules are, or should be, part of his training in his ARES group. They are presented herewith somewhat at random and should be digested by all amateurs, whether active in emergency communications preparation or not.

1. Keep the QRM level down. In an emergency, many of the most crucial stations will be weak in signal strength. It is most essential that all other stations *remain silent* unless they are called upon. When in doubt as to whether or not to turn on your transmitter, don't. Our amateur bands are very congested. If you want to help, study the situation by *listening.* Don't transmit unless you are sure you can help by doing so. Don't ever break into an emergency net just to inform the control station you are there if needed.

2. Monitor established emergency frequencies. Many localities and some geographical areas have established emergency frequencies on which someone is always (or nearly always) monitoring for possible calls. When not otherwise engaged, it is helpful simply to sit and listen on such frequencies, some of which are used for general rag-chewing as well as emergency preparedness drilling. On cw, SOS (without spaces) is universally recognized but has some legal aspects that should be considered where the need is not truly crucial. On voice, one can use "MAYDAY" (universal, the phone equivalent of SOS) or, to break into a net or conversation, the word "emergency."

3. Avoid spreading rumors. During an emergency, especially on the phone bands, you may hear almost anything. Unfortunately, much misinformation is transmitted. Rumors are started by expansion, deletion, amplifying or modifying words, exaggeration or interpretation. *All addressed transmissions should be officially authenticated as to their source.* They should be repeated word for word, if at all, and only when specifically authorized. In an emergency situation, with everyone's nerves on edge, it is little short of criminal to make a statement on the air without foundation in authenticated fact.

4. Authenticate all messages. Every message which purports to be of an official nature should be *written* and *signed.* Whenever possible, amateurs should avoid initiating emergency traffic themselves. We do the communicating; served-agency officials supply the content of the communications.

5. Strive for efficiency. Whatever happens in an emergency, you will find hysteria, and some amateurs who are activated by the thought that they must be "sleepless heroes." Instead of operating your own station full time at the expense of your health and efficiency, it is much better to serve a shift at one of the best located and best equipped stations, suitable for the work at hand, manned by relief shifts of the best-qualified operators. This reduces interference and secures well-operated stations.

6. Select the mode and band to suit the need. It is a characteristic of all amateurs to believe that their favorite mode and band is superior to all others. For certain specific purposes and distances, one or the other may indeed be preferable. The merits of the use of each in a communications emergency should be evaluated impartially with a view to apportioning to each the type of work for which it is best suited. There is, of course, no alternative to using what happens to be available, but there are right and wrong purposes for which it might be used. Long experience has developed the following advantages:

For cw:

1) Less QRM in most amateur bands.

2) Secrecy of communications — contents of communications cannot be intercepted, generally speaking, by the general public, to start rumors or undue concern.

3) Simpler transmitting equipment.

4) Greater accuracy in record communication.

5) Longer range for a given amount of power.

For Phone:

1) More practical for portable and mobile work.

2) More widespread availability of operators.

3) Faster communication for informal or "command" purposes.

4) More readily appreciated and understood by the public.

5) Official to official and phone patch communication.

For RTTY: Advantages (1) and (2) of cw, advantage (2) of phone, plus greater speed in record communication than any other mode.

The well-balanced emergency organization will have cw, phone and RTTY channels available, in order to utilize the advantages of all three as outlined above. Of course one must make the best use of whatever is available, but a great deal of efficiency is lost when there is lack of coordination or liaison between the different types of operation in an emergency. Absolute impartiality, willingness to let performance speak for itself — these are prime requests if we are to realize the best possible results.

7. Use all communications channels intelligently. All object of emergency communications is to save lives — anything else is incidental. Amateur Radio is a secondary communications means; normal channels are primary and should be used if available. Emergency channels other than amateur which are available in the absence of amateur channels should be utilized without fear of favoritism in the interest of getting the message through.

8. Don't "broadcast." Some amateur stations in an emergency situation have a tendency to emulate "broadcast" techniques. While it is true that the general public may listen to many of our transmissions, they are not and should not be made for that purpose. Broadcast stations are well equipped to perform any such service. Our job is to communicate for, not with, the general public. FCC regulations 97.117 applies.

Principles of Repeater Operation

Much amateur operating in emergencies is done by use of repeaters, so a few words about some of the special problems involved are in order.

1. Use minimum power. If your rig has a low and high power position, use the *low position* whenever you are close enough to the repeater to get by with it. Otherwise, especially in heavily-populated areas, you may run the risk of keying more than one repeater, thus causing unnecessary QRM.

2. Use simplex (direct) operation when possible. ARRL recommends 52/52 on 2 meters, but it's a good idea to have at least one other simplex channel available. Usual procedure: when you are within a very few miles of your contact, switch to a mutually available simplex channel, to free the repeater for those who need it. The simplex channels can accommodate more simultaneous contacts than repeater channels because of shorter range. However, a gain or beam antenna at stationary locations can enhance simplex operation.

3. Observe the "pause" procedure between exchanges. When it comes your turn to transmit, after the transmitting station stands by, count to two or three before pressing your "transmit" switch. This leaves time for a "breaker" if one is on frequency.

4. Be alert for emergency and public service opportunities. A huge percentage of amateurs have 2-meter fm rigs in their cars, and highway assistance is commonplace. This is especially important in accidents which have *just happened.* In such a case, feel free to "break into" any conversation then taking place on any repeater.

5. Listen much, transmit little. Always a good procedure to announce your presence on a repeater, always a *bad* one to tie it up with idle or inane chatter.

6. Keep your mobile fm rig on standby (squelch) on a repeater or simplex channel when on the road. The League recommends 34/94 repeater (if in range) or 52/52 (if no repeater in range).

7. Think before you talk, especially in an emergency situation. Anyone with an inexpensive public-service-band receiver can monitor. Stick to facts, control your emotions, watch your language. During an emergency is the time when you are most apt to act and speak rashly.

8. Articulate, don't slur. Speak close to your mike but talk across it, not into it. Keep your voice down. In an emergency situation one often gets excited, tends to shout. Control the impulse, for it will greatly decrease your intelligibility. Talk slowly, calmly -- this is the mark of a pro. We aren't pros, but the more we sound like them the better impression we will leave.

Repeaters and Emergency Preparedness

In the past decade, most repeater operation has been conducted on 2 meters. It is a certainty that repeater operation will con-

tinue to grow and other bands will be used. Already, the 220 MHz band is receiving widespread use, and 420 is used extensively for control links and shorter-range work. Six and ten meters are also being used. The future will surely produce extensive use of satellite repeaters and HF, linked repeaters and cross-band machines for longer distance coverages in practical communication. For practical emergency preparedness work and tactical communications during emergencies, we need channels that can be depended on, day and night, all seasons of the year regardless of sunspot cycle. Repeaters supply many of the answers to this need, and we amateurs can lead the way in providing it.

Liaison with the National Traffic System is practically a must for emergency traffic being handled on repeaters. A call for a NTS station in an emergency may produce results, but even better results can be obtained if a check-in by one or more NTS stations can be planned in advance. NTS is valuable for handling any traffic that cannot be handled within the local repeater coverage area.

Organization

There are three levels of ARES organization — national, section and local. National emergency coordination at ARRL headquarters is under the supervision of the ARRL communications manager, who is responsible for advising all ARES officials regarding their problems, maintaining contact with federal government and other national officials concerned with amateur emergency communications potential, and in general with carrying out the League's policies regarding emergency communications. At section level, the section emergency coordinator is appointed by the section communications manager (who is elected by the ARRL members in his section) and works under his supervision. In most sections, the SEC and SCM work together in setting up a section emergency communications plan, and in appointing district and local ECs to implement it; in some, the SCM leaves it entirely to the SEC, who nevertheless must have the SCM's approval of everything he does. Some of the ARRL sections with capable SECs are organized to the hilt. A few have scarcely any organization at all. It depends almost entirely on whom the section members have put into office as SCM and whom he has appointed as SEC.

It is at the local level where most of the real emergency organizing gets accomplished, because that's the level at which most emergencies occur, at which ARES officialdom makes direct contact with the ARES member-volunteers and with officials of the to-be-served agencies. The local EC is therefore the key man in the ARES. This official is appointed by the SCM, usually on the recommendation of the SEC and DEC. Depending on how the SCM-SEC team has set up the section for administrative purposes, he may have jurisdiction over a small community or a large city, an entire county or even a group of counties. Whatever jurisdiction is assigned, *the EC is in charge of all ARES activities in his area, not just one interest group, one agency, one club or one band.*

Now that we have looked at the top of the section organization and the local level where the actual communications take place, it would be well to recognize that in the large sections the local groups could proliferate to the point where simply keeping track of them would be more than a full-time chore, not to mention the idea of trying to coordinate them in an actual emergency. To this end, SCMs and SECs have the option of grouping their EC jurisdictions into logical units or "districts" and appointing a district EC to coordinate the activities of the local ECs in the district. In some cases, the districts conformed to the boundaries of governmental planning or emergency-operations districts, while in others they are simply based on

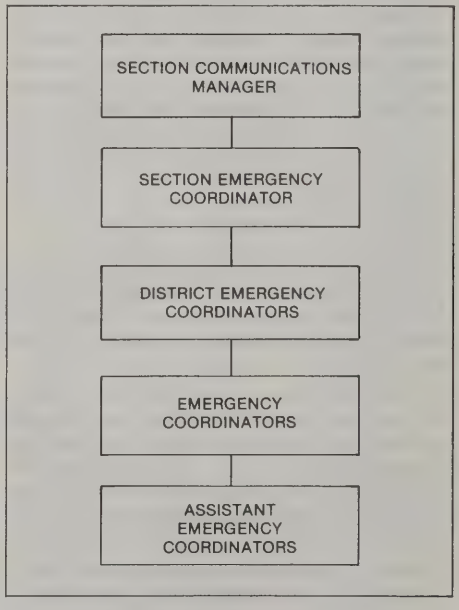

Fig. 2 — Section structure for ARES.

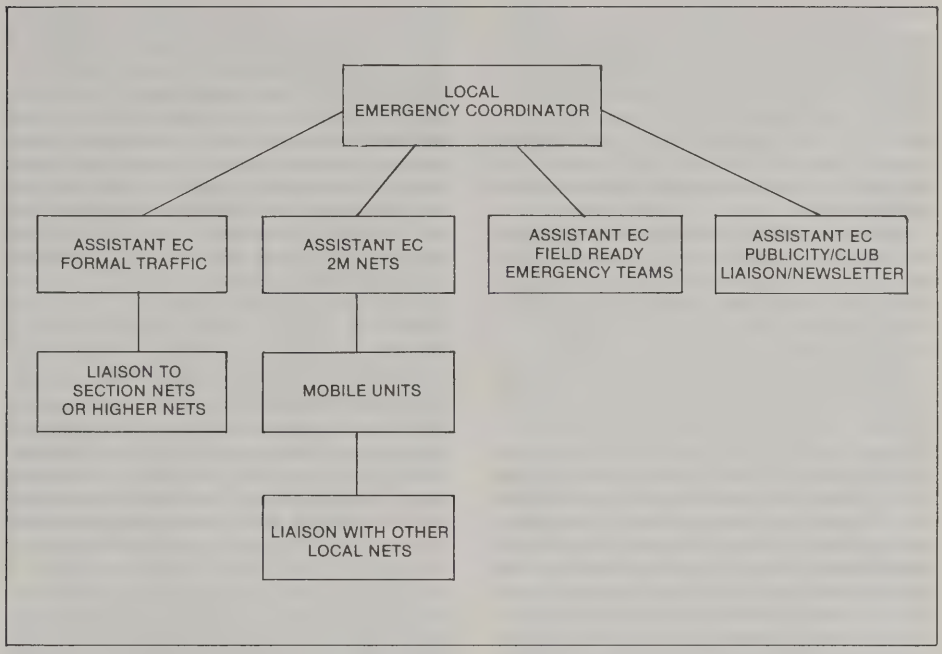

Fig. 3 — Local ARES structure.

repeater coverage or geographical boundaries. Figure 2 depicts the typical section ARES structure.

Special interest groups are headed up by "assistant emergency coordinators," designated by the EC to supervise activities of groups operating in certain bands, especially which play an important role at the local level; but they may be designated in any manner the EC deems appropriate. See Figure 3.

These assistants, with the EC as chairman, constitute the local ARES "planning committee" and meet together from time to time to discuss problems and plan projects to keep the ARES group active and in a high state of training.

There are any number of different situations and circumstances that might confront an EC, and his ARES unit should be organized in anticipation of them. His job is not likely to be monotonous or humdrum. An EC for a small town might find that the licensed amateur group is so small that appointing assistants is unnecessary or undesirable. On the other hand, an EC for a large city may find that even his assistants need assistants and sometimes it is necessary to set up a special sub-organization to handle it.

Operation

There is no specific point at which organization ceases and operation commences. Both phases are concurrent, because a living organization is a changing one, and the *modus operandi* of necessity changes with changes in the organization.

The chart on page shows how a typical ARES unit may be organized.

Just what shape the plan in your locality will take depends on what your EC has to work with. He uses what he has, and leaves provision in the plan for what he hopes, wants, is trying to get. *Flexibility* is the keynote. The personnel, equipment and facilities available today may not be available tomorrow, or the availability may be greater. In any case, bear in mind that organizing and planning are not a one-man task. The EC is simply the leader or, as the title indicates, the coordinator. His effectiveness inevitably will depend on what kind of a group he has to work with; that is, on you and your cohorts. So a good thing to do is make yourself available to your EC as a member of his planning committee, or in any capacity for which you think you are qualified.

Usually, local ARES operation will take the form of nets -- hf nets, vhf (repeater) nets, even RTTY or other special-mode nets (such as ASCII) if the area produces the required wherewithal in the form of people and equipment. Your EC should know where your particular interests lie, so that you can be worked in where your special talents will do the most good.

It is not always possible to utilize the services of all ARES members. While it is general policy that no ARES member must belong to any particular club or organization to participate in the program, local practical considerations may be such that you cannot be used. This is a matter that has to be decided on by your EC. In some cases, even personality conflicts can cause difficulties; for example, the EC may decide that he cannot work with a particular person with whom he has a personality conflict, and that the local ARES would be better served by excluding that person. This is a judgment that the EC would have to make; while personality conflicts should be avoided, that they do arise, more often than we would prefer, is a fact. The EC on the job must take the responsibility for making such subjective evaluations, just as the SEC and DEC must evaluate the effectiveness of the job being done by the EC.

Operation in an emergency net is little different from operation in any other net, except that here the object is preparation for emergency. This includes training in handling of written messages -- that is, what is generally known as "traffic handling." How to handle traffic is covered in a companion publication, *Operating an Amateur Radio Station.* This is required reading for all ARES members -- in fact, for all amateurs aspiring to participate in emergency communications.

While much communicating amateur-to-amateur in an emergency is of a procedural or tactical nature, the real meat of communicating is third-party traffic, the communications you handle involving persons other than the operators of the two stations concerned. *Most of this should be in standard message form.* True, in times of stress this is not always possible, but there is a common tendency to shirk it which should be avoided. The record should show, wherever possible, (1) a message number for reference purposes, (2) a precedence indicating its importance, (3) a station of origin so any reply or handling inquiries can be referred to that station, (4) a check (count of the number of words in the message text, so receiving stations will know whether any words were missed, (5) a place of origin, so the recipient will know where the message came from (not necessarily the location of the station of origin), (6) filing time, ordinarily optional but in an emergency-type message, of great importance, and (7) date of origin. The address should be complete and include a telephone number if known. The text should be short and to the point, and the signature should contain not only the name of the person sending the message but his title or connection also, if any.

This procedure is not something picked up solely by reading or studying. There is no substitute for actual practice. Your emergency net should practice regularly -- much more often than it operates in a real or simulated emergency. Avoid complacency, the oft-felt feeling that you will know how to operate when the time comes. You won't, unless you do it frequently, with other operators whose style of operating you get to know.

Equipment Considerations

It is not to be expected that every amateur will prepare himself for an emergency by having a complete and separate self-powered station, although a large number of individuals and groups do so. There is, however; no reason why any enterprising amateur cannot prepare his station for an emergency by having an emergency power supply ready and a quick means for utilizing all or part of his regular station equipment as an emergency-powered station. The emergency power supply can be anything from a small transistor supply operated from batteries to a large gasoline-driven generator.

Equipment most suitable for emergency use is that which contains the utmost in compactness, portability and versatility. Within these three requirements, emergency equipment is little different from any regular station equipment. It is chiefly the power supply which determines whether or not a piece of equipment is useful in emergencies.

Operation from a gasoline-driven generator need not be discussed, since normally such operation is identical to that to be expected from the commercial a.c. lines. The primary considerations concerning emergency power have to do with battery-operated power supplies. Transistor packs are used almost exclusively, these days.

Equipment used for emergency purposes can be specially designed and built, but most of today's amateur gear is compact enough

so that it can be transported rather easily. Therefore, the principal requirement is that arrangements be made to transport it quickly and set up promptly at the point from which it is to be used. Many emergency operation centers and government buildings are already equipped with emergency power, so standard a.c.-supplied units can often be used. Otherwise, batteries of some kind will be necessary: dry batteries (limited life) or rechargeable batteries such as NiCads or lead-acid or other "storage" types. The latter especially are more apt to be available, because they are used in every automobile and battery-start engine and can be recharged from those same engines, regardless of the latter's other purpose. For example, a storage battery being used to power a communications unit, when nearly spent, can be swapped for a charged-up battery in a transportation unit. Use in the transportation unit can charge it up again, at which time another swap can be made.

Mobile operation from vehicles is not the answer to everything. The availability of portable units and hand-held units is a definite asset in any emergency, making spot communications available from places where automobiles cannot go. This usually means vhf and operation from dry batteries.

Operation on vhf-fm is the "way to go" for emergency purposes in today's Amateur Radio. Repeaters are available almost everywhere, and many of them are equipped for operation in emergencies. Some ARES units even have their *own* repeaters, as do RACES and MARS groups. So, almost a necessity is equipment capable of triggering one or more repeaters in the affected area. Whether they are emergency-communications oriented or not, most of them *will* be used in an emergency situation if they remain on the air – and most repeater owners (group or individual) will be more than willing to have them used for this purpose on a planned basis.

For emergency purposes, your best bet is a two-meter fm unit. Usually, very low power (one or two watts) is sufficient to work through most repeaters. This can be accomplished using self-contained dry batteries, although provision to use an automobile storage battery is also very helpful. Check on what the amateurs in your area are using; you may find that you would be better advised to use a different band from 2 meters, or the nearest repeater is too far away to key with one watt, in which case a different rig or one with more power may be required.

IV — THE RADIO AMATEUR CIVIL EMERGENCY SERVICE

After World War II, when it became evident that the international situation was destined to be tense and the need for some civil defense measures became apparent, successive government agencies designated to head up such a program called on amateur representatives to participate. In the discussions that followed, we were interested in getting two points across: first, that Amateur Radio had a potential for and capability of playing a major role in this program; and second, that our participation should, this time as never before, be in our own name, as an *Amateur Radio Service*, even if and after war should break out. These principles were included into the planning by the formulation of regulations creating a new branch of the amateur service, the Radio Amateur Civil Emergency Service, RACES.

Recognition of the role of Amateur Radio as a public service means *responsibility* — this time in our own name. The RACES regulations are printed in full in the ARRL *License Manual*, along with the rest of the amateur regulations, and will not be reprinted herein. Nevertheless, every amateur should study closely and become familiar with these rules; for civil preparedness, now a major function, will become our only on-the-air function if we are plunged into war.

What is RACES?

RACES, administered by the Federal Emergency Management Agency of the United States government, is a part of the Amateur Radio Service that provides radio communications for civil preparedness purposes only, during periods of local, regional or national civil emergencies. These emergencies are not limited to war-related activities, but can include natural disasters such as fires, floods and earthquakes. As defined in the rules, RACES is a radiocommunication service, conducted by volunteer licensed amateurs, designed to provide emergency communications to local or state civil preparedness agencies. It is important to note that RACES operation is authorized by the FCC upon request of a state or federal of-

ficial, and is strictly limited to official civil preparedness activity, in the event of an emergency communications situation.

Operating Procedure

Amateurs operating in a local RACES organization must be officially enrolled in that local civil preparedness group. RACES operation is conducted by amateurs using their own primary station licenses, and by existing RACES stations. The FCC no longer issues new RACES (WC prefix) station call signs. Operator privileges in RACES are dependent upon, and identical to, those for the class of license held in the Amateur Radio Service. All of the authorized frequencies and emissions allocated to the Amateur Radio Service are also available to RACES on a shared basis. But in the event that the President invokes his War Emergency Powers, amateurs involved with RACES would be limited to the following frequencies (while all other amateur operation would be silenced):

kHz	
1800-1825	3984-4000
1975-2000	7097-7125
3500-3550	7245-7255
MHz	
14.047-14.053	53.300
14.220-14.230	53.350-53.750
21.047-21.053	145.170-145.710
28.550-28.750	146.790-147.330
29.450-29.650	220-225
50.350-50.750	

While RACES was originally based on potential use for wartime, it has evolved over the years, as has the meaning of civil defense (which is also called civil preparedness), to encompass all types of emergencies. It should be emphasized again that RACES is part of the amateur service, its regulations are part of the amateur regulations, and it operates in the amateur bands. The segments of the amateur bands it uses are shared with the rest of the amateur service in peacetime; in the event of war, its frequency segments would be exclusive.

While operating in a RACES capacity, RACES stations and amateurs registered in the local RACES organization may not communicate with amateurs not operating in a RACES capacity. (Of course such restrictions do not apply when such stations are operating in a non-RACES -- such as ARES --amateur capacity.) Only civil preparedness communications can be transmitted, as defined in FCC regulations, section 97.161. Tests and drills are permitted only for a maximum of one hour per week. All test and drill messages must be clearly so identified.

ARES and RACES

Although RACES and ARES are separate entities, we advocate dual membership and cooperative efforts between both groups whenever possible. The RACES regulations now make it simple and possible for an ARES group whose members are all enrolled in and certified by RACES to operate in an emergency with great flexibility. Using the same operators and the same frequencies, an ARES group also enrolled as RACES can "switch hats" from ARES to RACES and RACES to ARES to meet the requirements of the situation as it develops. For example, during a "nondeclared emergency," ARES can operate under ARES, but when an emergency or disaster is officially declared by a state or federal authority, the operation can become RACES with no change in personnel or frequencies.

This situation is still not well understood and accepted throughout the United States; both ARES and RACES still exist, separately, in many areas. League Officials will have to determine the situation in their own area. Where there is currently no RACES, it would be a simple matter for an ARES group to enroll in that capacity, after a sophisticated presentation to the civil preparedness authorities. In cases where both ARES and RACES exist, it is possible to join both or to be involved in either. As time progresses, the goal would be the merger into one strong organization, with coordination between ARES and RACES officials using the same groups of amateurs. In some sections of the U.S. today, the ARES structure has also been accepted as the RACES structure.

Other Amateur Facilities

There are a number of other Amateur Radio facilities, not sponsored or directly affiliated with the League, which are nevertheless an integral part of our public service effort. Some of these organizations are the monitoring services, MARS, independent nets (both international and domestic), and the like. While naturally we want you to participate in organizations sponsored by your League, better to participate in a non-League-sponsored public service organization than not to participate at all. In this booklet we can not give details of the operation of these other organizations because there are too many of them, and their operations change too rapidly. Suffice it to say that they do exist, and they are worthy of your support.

V — THE NATIONAL TRAFFIC SYSTEM

Traffic Handling. The fastest and most efficient method for handling message traffic by Amateur Radio has been a primary topic of discussion in amateur circles since 1914, when Hiram Percy Maxim formed the American Radio Relay League for this purpose. At first random relaying was used, then trunk lines were set up. All this was washed out by World War I, and after the war the trunk lines were slow in being revitalized. Nevertheless, by the mid-thirties ARRL was operating 14 trunk lines crisscrossing the country, and interest had never been higher.

Again war came and suspended all such activity. After hostilities ceased in 1945 the trunk lines were again set up, but operating methods had changed and there was much dissatisfaction. Many considered the trunk lines concept obsolete in view of longer ranges, more versatile equipment, and new operating techniques developed during the war. So, in 1949 responsive to membership demand, ARRL established the National Traffic System.

A bit shaky at first, NTS soon became stabilized and has since become an established part of Amateur Radio's public service effort. It has been said, probably rightly so, that NTS is the tightest and solidest organization within the ARRL framework.

Introductory. The National Traffic System plan is a means for systematizing amateur traffic-handling facilities by making available a structure for an integrated traffic facility designed to achieve the utmost in two principal objectives: (1) rapid movement of traffic from origin to destination, and (2) training of amateur operators in handling of written traffic and participating in directed nets. These two objectives, which sometimes conflict with each other, are the underlying considerations in the National Traffic System about to be described.

This system is in daily operation. Its personnel consists mainly of those operators who, while interested in traffic handling, are unable, either through necessity or inclination, to spend more than one or two periods a week in this pursuit. Thus, NTS is a step *away* from the traditional "iron man" type of traffic handling which characterized our "trunk lines" of yesteryear. If you can spend one regular period a week handling traffic and are interested in doing so, NTS can use you.

General. The National Traffic System is an organized effort to handle traffic in accordance with a plan which is easily understood, is basically sound, and which utilizes modern methods of network traffic-handling in general acceptance today. It encompasses all parts of the ARRL Field Organization (U.S., Canada and possessions).

NTS is not intended as a deterrent or competition for the many independently-organized traffic networks. When necessitated by overload or lack of outlet for traffic, the facilities of such networks can function as alternate traffic routings where this is indicated in the best interest of efficient message relay and/or delivery.

One of the most important features of NTS is the "system concept." No NTS net is an independent entity which can conduct its activities without concern for or consideration of other NTS nets. Each net performs its function and *only* its function in the overall organization. To whatever extent nets fail to perform their functions or perform functions intended for other nets, to this extent is the overall system adversely affected.

Nets may sometimes find it necessary to adopt temporary expedients to insure movement of traffic, and this is considered improper operation only when no attempt is made to return to the normal schedule. Nevertheless, improper operation of any NTS net is the concern of *all* NTS nets, and every effort should be made to assist in returning any nonfunctioning or improperly functioning net to its normal operation.

Membership. Individual station participation in NTS is recognized by issuance of certificates (see p. 22). Organizationally speaking, the "members" of NTS are the nets which participate therein. Most such nets were created and organized for NTS purposes only and operate at specific times for specific purposes to be described later. Procedures are somewhat specialized, particularly at Region, Area and TCC levels.

Frequently ARRL headquarters is asked how a net may become a part of NTS. This usually isn't easy, because NTS is not a "club for nets" which any existing net may join at will. In addition, making nets a part of NTS is less a matter of official action than a "state of mind" of the net itself. In this connection, the following points deserve mention:

a. Nets operating with ARRL section boundaries, or otherwise at local or section

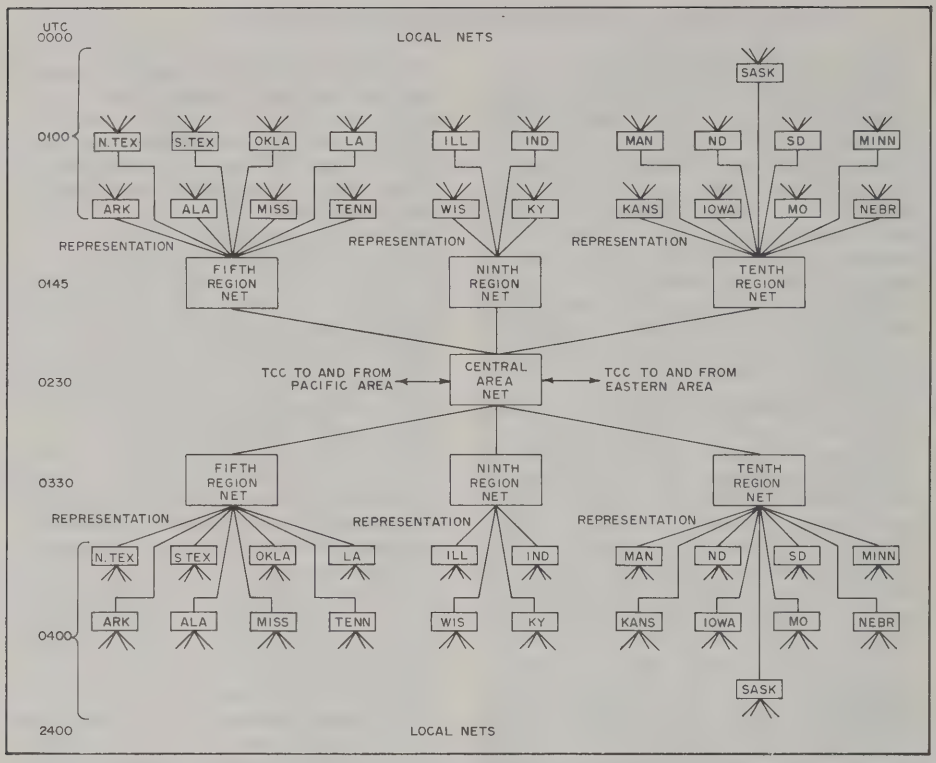

Fig. 4 — A diagrammatical portrayal of the evening (or cycle four) NTS setup in the Central Area, showing times of net meetings at the various levels in UTC. Note that the early and late functions of local nets are combined at 2400/0000. Some of the other net echelons have alternatives not shown above.

level, may become a part of NTS by performing the functions of such (see paragraphs on section nets, page 17).

b. Nets whose coverage extends beyond section boundaries but within region (roughly, call area) boundaries may become a part of NTS only by foregoing their general membership and setting up to operate as a session of the region net (see paragraph on region nets, pages 17-18). Such nets would act as one of that region's net sessions and would be under the jurisdiction of the region net manager appointed by ARRL. In all NTS history so far, no net has succeeded in adapting itself to the NTS regional function. All present NTS region nets were organized specifically for that purpose.

c. Since operation at area level is so specialized, it is not possible for nets whose coverage extends beyond region boundaries to be a part of NTS at any level.

d. Any net which becomes a part of NTS is expected to observe the general principles of NTS procedures as outlined in Appendix I herewith.

e. Generally speaking, participation in NTS is best performed by individual-station participation in an already-existing NTS net, at whichever level.

f. Lack of recognition as an NTS net does not imply that such a net is without ARRL recognition or support. All public service nets on which information is received are included in the League's net information and activities often summarized monthly in the appropriate part of *QST*. Although NTS is the League-sponsored organization for systematized traffic handling, it is far from being the League's only interest in public service communication.

Mode. The National Traffic System is not dedicated specifically either to phone or cw, or any other type of emission, nor to the ex-

clusion of any of them, but to the use of the best mode for whatever purpose is involved. The aim is to handle formal written traffic *systematically,* by whatever mode best suits the purpose at hand. Whether phone, cw, or radioteletype is used for any specific purpose is up to the net manager or managers concerned and the dictates of logic. There is only one National Traffic System, not separate ones for each mode. Modes used should be in accordance with their respective merits, personnel availabilities and liaison practicalities. Whatever mode or modes are used, we all work together in a single and thoroughly integrated National Traffic System.

Principles of Operation

The National Traffic System consists of four different levels of nets which operate in an orderly time sequence to effect a definite flow pattern for traffic from point of origin to point of destination. A message flows through the National Traffic System in a manner similar to an air line passenger who starts out in a small residential town with a destination across the continent in another small town. He has to change carriers many times in the process, starting with a local ground conveyance to a feeder air line, to a transcontinental air line, to another feeder air line, then local transportation to deliver him to his destination. In a very similar manner, the transcontinental message starts with the originating station in a local net, is carried to the section net, the region net, the area net, via Transcontinental Corps (TCC) to a distant area net, then back down the line to delivery.

Of course the message, like the passenger, can "get on" or "get off" at any point if that's its origin or destination. Thus, a message from, say, New York to Detroit would never get on TCC, but would "get off" at *area* level. A message from San Francisco to Los Angeles would not go beyond *region* level, and one from San Antonio to Houston would remain inside the *section* net.

Local nets are those which cover small areas such as a community, city, county or metropolitan area, not a complete ARRL section. They usually operate by vhf (typically 2-meter fm) at times and on days most convenient to their members and are often designated as "emergency" (ARES) nets that do not specialize in traffic handling. The time slot designated for them in Fig. 4 is thus nominal and will vary considerably. Local nets are intended mainly for local delivery of traffic on an emergency basis, inasmuch as such delivery could ordinarily be effected conveniently by non-toll telephone. Some NTS local nets operate on a daily basis, just as do other nets of the system, to put the traffic as close as possible to its actual destination before delivery – a matter of practice in a procedure that might be required in an emergency.

Use of Repeaters. Most local nets and even some section nets in smaller sections are using repeaters to excellent effect. Average coverage on vhf can be extended tenfold or more using a strategically located repeater, and this can achieve a local coverage area wide enough to encompass many of the smaller sections. Since propagation conditions on the high frequencies are erratic, more use of vhf and repeaters is recommended at local levels.

Section Nets. Organizational and procedural lines begin to tighten at the section net level. Coverage of the section may be accomplished either by individual stations reporting in, or by representatives of NTS local nets, or both. Ordinarily, all section amateurs are invited to take part; however, in a high-population section with several metropolitan areas covered by local nets, representation may be by such liaison stations *plus* individual stations in cities or towns not covered by local nets.

The section may have more than one net (e.g., a cw net, a vhf net, a ssb net, etc.), or two or more sections may combine to form a single net operating at section level, if low population or activity seem to make this desirable. Section nets are administered through the office of the section communications manager, with authority for this function usually delegated to an appointed section traffic manager or designated net managers. In the case of combined-section nets, officials of the sections concerned should collaborate on the designation of a qualified amateur to manage the net. The purpose of the section net is to handle intra-section traffic, distribute traffic coming down from higher NTS echelons, and put inter-section traffic in the hands of the amateur designated to report into the next-higher NTS (region) echelon. Therefore, the maximum obtainable participation from section amateurs is desirable.

Region nets cover a wider area, such as a call area. At this level the object is no longer mass coverage, but *representation* of each ARRL section within the region. Par-

ticipants normally include (1) a net control station, designated by the region net manager, (2) representatives from each of the various sections in the region, designated by their section net managers, (3) one or more stations designated to handle traffic going to points outside the region, designated by the region net manager, (4) one or more stations bringing traffic down from higher NTS echelons, and (5) any other station with traffic for some point within that region, but not within his own section. There may be more than one representative from each section in the region net, but more than two are usually superfluous and will only clutter the net; however, all section representatives are required to represent the entire section, not just their own net.

The purpose of the region net is to exchange traffic among the sections in the region, put out-of-region traffic in the hands of stations designated to handle it, and distribute traffic coming to the region from outside among the section representatives. Region nets are administered by net managers appointed by ARRL headquarters under the supervision of the ARRL communications manager.

Area Nets. At the top level of NTS nets is the area net. In general, the area net is to the region net what the region net is to the section net; that is, participation at area level includes (1) a net control station, designated by the area net manager, (2) one or more representatives from each region net in the area, designated by the region net managers, (3) stations designated to handle traffic going to other areas, (4) stations designated to bring traffic *from* other areas, and (5) stations having traffic for points in the area not their own region. Points (3) and (4) are functions of the Transcontinental Corps, to be described later. There are three areas, designated Eastern, Central and Pacific, the names roughly indicating their coverage of the U.S. and Canada except that the Pacific Area includes the Mountain as well as the Pacific time zones. Area nets are administered by managers appointed under the jurisdiction of the ARRL communications manager.

Transcontinental Corps. The handling of inter-area traffic is accomplished through the facilities of the TCC. This is not a net, but a group of designated stations who have the responsibility for seeing that inter-area traffic reaches its destination area. It is administered by TCC directors, in each area, who assign stations to report into area nets for the purpose of "clearing" inter-area traffic, and to keep out-of-net schedules with each other for the purpose of transferring traffic from one area to another. Further details of TCC operations are contained in Appendix III (see p. 27).

Sequence of Net Meetings. The order in which the various nets meet is essential to the proper operation of the system. The effectiveness of the National Traffic System depends on a delicate balance of voluntary cooperation and adherence to established procedures. Accordingly, the NTS Inter-Area Staff (consisting of representatives of each of the three area staffs) recommended a symmetrical, four cycle NTS net sequence, which is being implemented on a one-year trial basis. The schedule, in local time, is as follows:

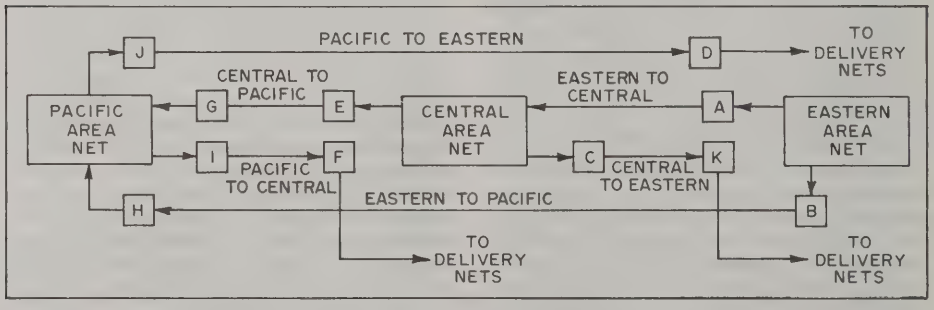

Fig. 5 — How cycle four TCC works. Small blocks denote daily station functions, station A being the only one that reports into an Area Net other than its own. Note that traffic from east to west goes into area nets while traffic from west to east may go into section or region nets to save time.

Cycle ONE	Cycle TWO
10:00 a.m. Section	1:00 p.m. Section
10:45 a.m. Region	1:45 p.m. Region
11:30 a.m. AREA	2:30 p.m. AREA
12:30 p.m. Region	3:30 p.m. Region
Cycle THREE	**Cycle FOUR**
4:00 p.m. Section	7:00 p.m. Section
4:45 p.m. Region	7:45 p.m. Region
5:30 p.m. AREA	8:30 p.m. AREA
6:30 p.m. Region	9:30 p.m. Region
	10:00 p.m. Section

Cycle Four is the basic NTS evening schedule of long-standing. Cycle Two was activated on June 1, 1980, as the basic daytime NTS schedule. Cycles One and Three are plugged in specifically for high-volume situations, to improve and enhance the response of NTS to emergency and overload situations. If needed, the entire system can be activated in three-hour shifts. Cycles Two and Four form the daily NTS schedule during normal conditions.

A few features of this NTS structure may need some elaborating: In essence, the Inter-Area plan paves the way for NTS to truly be one, unified system, not separate-but-equal daytime and evening communities. The primary function of TCC (Transcontinental Corps) is to link, rather than isolate, the two cycles. For example, prior to June 1, evening TCC bypassed the daytime cycle, thereby causing unnecessary delays in traffic delivery.

As evidenced by the schedule, the Inter-Area plan calls for each area net (PAN, CAN, EAN) to hold one session per day at 2:30 P.M. local time, the same concept as in the evening cycle, where each net meets at 8:30 P.M. local time. Area nets then have a minimum of 60 minutes alloted to them, daytime or evening, and all 60 minutes are available for the clearing of inter-area (TCC) traffic. The system is symmetric, regular and repeatable. This means first, that the structure of the net sequencing is consistent from area to area, and second, that a net session occurring at a given local time in the Eastern area should subsequently occur at the corresponding local times in the Central and Pacific areas.

Modifications to the system schedule for emergencies and emergency-preparedness exercises, such as SET, augment the basic cycles and are replications of the basic cycles. More importantly, normal daily sessions of nets at all levels of the system (ideally) remain intact during emergency operations. Expansion of the system during overloads is simple, involving a duplicate of the existing schedule, slid over three hours. Therefore, in addition to the normal area net sessions at 2:30 P.M. (Cycle Two) and 8:30 P.M. (Cycle Four), potential new area net sessions at 11:30 A.M. (Cycle One) and 5:30 P.M. (Cycle Three) can be held, along with their associated region and section nets. Again, Cycles Two and Four serve as the basic daily NTS schedule.

Traffic from EAN to CAN in either the daytime or evening cycle is handled by direct QNI into CAN by the TCC operator. All other TCC functions are out-of-net schedules, allowing optimum choice of bands and mode to fit varying propagation conditions. The time between the end of the daytime PAN session and the start of the evening EAN session allows for an out-of-net TCC sked followed by direct section net QNI on the east coast, to speed up the same day delivery service. TCC skeds are from one cycle to the same cycle for westbound traffic, or from one cycle to the next immediate cycle for eastbound traffic. That is to say, TCC functions which bring traffic from the west coast to the east coast, for example, connect the daytime PAN session with evening nets in the east, or the evening PAN session with the next daytime EAN sequence. The significance of this concept is that it combines the discipline and training of a predertermined schedule, with the spontaneous determination of the level of activity required for any specific emergency exercise.

The goals of the Inter-Area plan are as follows:

Make daytime and evening NTS actually part of a single, unified system.

Resolve net time-conflicts between areas.

Enhance daytime/evening participation.

TCC functions providing daytime/evening crossovers, so that traffic is delivered in the next available cycle of NTS, regardless of time of day or mode.

The system will be consistent from area to area, from cycle to cycle.

Evening participants will understand (and support) the daytime cycle and vice versa, with no additional training.

No traffic will be compromised for any other traffic by irregular net sequencing.

Options. NTS is a volunteer traffic system, and it is not always practical to find traffic stations able to participate in nets at various levels at particular times. While in principle NTS nets find the personnel who can participate at the time designated, rather than

change the time to suit the personnel, there is occasionally a necessity for a certain amount of non-uniformity in net meeting time, and options may be used at the discretion of the net manager. However, any such options are to be considered temporary and a return to normal NTS-recommended operating times should be made as soon as possible. The times designated in the chart are, therefore, the *normal* NTS operating times, and the nets listed show the *starting* times of those nets. The identity of participants in each of these nets is discussed in the previous section.

Whenever changes from normal routings and sequences are made, headquarters should be notified so that information on them will be available at a centralized point. In NTS, the right hand should always know what the left hand is doing. No NTS net should consider itself independent of or unconcerned with the functioning of other parts of the system.

Deviation from Normal Routing. Failure to use the normal routings described above, if carried to the extreme, will result in "strangulation" of one or more NTS nets at region or area level. That is, if section nets send representatives to other section nets to clear traffic direct instead of through the region net, the region net will "starve" for traffic. Similarly, if region nets maintain liaison with each other direct instead of through the common medium of the area net, the latter will have little traffic and will not prosper. It is in the interest of efficiency, organization, system, training and conservation of skilled personnel to use the NTS structure as it is intended to be used.

However, let's not be ridiculous. Those who would follow the system to the letter are occasionally guilty only of unnecessarily delaying delivery. Any station in NTS, regardless of the function he is performing, who receives a message destined to a point in his local calling area, should deliver that message rather than filter it further through the system. There are many metropolitan areas which straddle NTS net coverage boundaries but have common toll-free telephone coverage.

Adherence to Schedules. Since NTS depends for its efficiency on chronology of net meetings, it naturally follows that adherence to NTS schedules is of the greatest importance. Particularly TCC and liaison stations should not be held on any NTS net beyond the time they are scheduled to meet another net, *even if all their traffic has not yet been cleared.* Leftover traffic should be held, put on alternate routes, or handled by special schedule later.

Along the same line, NTS nets should not operate beyond the time allotted to them. See time sequence on p. 19 to determine normal length of nets at various levels in the two cycles.

Alternate Routings. Deviations are made from normal routings *only* when normal channels are for some reason not available. A return to the use of normal NTS channels should be made as soon as possible. The net manager shall be the judge as to whether normal facilities are available, satisfactory or adequate in making any deviations. Alternate routings, if and when necessary, can include regular or specially-arranged schedules, direct liaison to the NTS destination net, or use of the facilities of independent networks.

QNI Policy. National Traffic System nets at local and section level are open to all amateurs in the coverage area of the net. At region and area level, participation is normally restricted to representatives of sections, and designated liaison stations. However, stations from outside the coverage area of the net concerned, or other not-regularly-designated participants who report in *with* traffic will be cleared provided they can maintain the pace of the net as to procedure, speed, and general net "savvy." Such stations reporting in *without* traffic will immediately be excused by the NCS unless they can supply outlets not at that time available through normal NTS channels. Visitors to NTS nets should bear in mind that NTS nets operate on a time schedule and that no offense is intended in observance of the above QNI policy.

Boundaries. NTS net coverage areas are strictly defined and strictly observed in daily operation of the system, at section level, by ARRL section boundaries, at region level accordance with the grouping of the sections into NTS regions based originally on call areas. Some of the regions are on call area basis (1st, 2nd, 3rd and 8th), but others cover parts of two or more call areas. At area level the original basis was standard time zones, and the boundaries still roughly follow these lines without dividing any sections. The NTS area and region map (Figure 6) and routing guide (p. 34) give full details of boundaries of the various NTS echelons of operations.

Fig. 6 — National Traffic System Area and Region Map.

Sections can be changed from one region to another at the request of the SCM thereof provided no disruption of the system's operation is involved. Normally, such requests will be considered only for sections located on boundary lines between regions. The time zone in which a section or region is located or mostly located exerts a strong influence in its assignment to a region and area.

Nomenclature. NTS nets at region and area level officially carry the name of the region or area they cover (e.g., Sixth Region Net, Pacific Area Net, etc.). Net "designations" at these levels vary somewhat (e.g., First Region Net is 1RN, Fifth Region Net is RN5, Twelfth Region Net is TWN and Eleventh Region Net, the only Canadian region net, calls itself Eastern Canada Net and uses the designation ECN). Section nets customarily carry the name of the section or sections they cover, but the actual name used is optional with the net. Some examples are Pine Tree Net (Maine), Buckeye Net (Ohio) and Northern California Net (five Calif. Sections).

Combined Section Nets. Some ARRL sections which have little or no traffic interest have not organized section nets, while in some cases two or more sections have combined their facilities into a single net operating at section level. This latter practice is considered a desirable one where circumstances make it necessary and feasible, and such a combined-section net can participate in NTS in the same way as any other section net, with each representative thereof representing both (or all) sections covered.

It is recommended that traffic handlers in sections which do not at present boast a section traffic net take steps to organize one for NTS representation. Lacking this, it might be possible to participate, temporarily at least, in the NTS net of an adjoining section, and be considered members of that section's net until such time as it is feasible to

establish one. Such an arrangement, of course, requires the acquiescence of the SCM, STM and net manager of the section net concerned.

Limited Load Capability. Because the system operates on a time schedule with a definitive flow pattern, NTS has difficulties under heavy load just as do all communications systems. Thus, in normal times, the system observes the "limited load" policy. It is the general policy on NTS to strive for handling the greatest quantity of traffic through *efficiency* rather than through long hours of operation. NTS nets must *begin and terminate* within certain time limits in order that liaisons can be maintained without delay. If traffic is not all cleared within the time limit, it is considered "overflow" traffic and must use alternative routings or be held over.

Load capacity can be increased by providing additional stations to carry on liaison functions and TCC operations; by providing separate receive and transmit stations; and by pre-net sorting of traffic by region (outside the area of origination) and area, and concentrating the traffic in the hands of separate operators. This allows more expeditious operation in the area net.

Observation of Time. In order to avoid confusion and effect standardization, NTS nets should endeavor to meet at the times officially designated for them in this booklet. Where temporary departures are necessary, care should be taken that this will not adversely affect the traffic flow or cause interference to other NTS nets because of time differences.

Frequencies. There is no specific NTS frequency plan at the present time. Each NTS net selects its own operating frequency in consideration of its requirements, with the advice and assistance of ARRL headquarters if desired. Because in an emergency it may be necessary to operate many NTS nets simultaneously which ordinarily operate at different times, it is desirable for nets within normal interference range of each other to use different center frequencies if possible. Within this consideration, it is also desirable to concentrate NTS operation on as few spot frequencies as possible for two reasons: (1) to conserve frequency space, and (2) to make *full* utilization of those spot frequencies used in order to help establish occupancy. ARRL's Net Directory records net frequencies and times and is useful to study in planning new nets.

Manager Appointments. NTS net managers at local and section level are appointed or designated by the SCM. All other NTS managers are appointed at the direction of the ARRL communications manager after recommendation from the area staff concerned and coordination with the SCM of the section in which the candidate resides. Net managers are appointed for no specific term of office.

Certification. NTS certificates are available at section, region, area and TCC level. Section net certificates are issued by the SCM, region and area net certificates by the net managers. A participating station is eligible for a NTS net certificate when it has completed three months of performance (at least once per week), on an assigned basis, of one or more of three essential duties:

1) Regular participation as a net station. In the case of region and area nets, this means official representation of a section or region within its respective region or area. *No credit is given in region or area nets for random participation.*

2) Liaison with other nets of the National Traffic System. This applies only to *regular* liaison in accordance with the NTS flow pattern *as assigned by the appropriate net manager.* In the case of section nets, liaison with their proper region nets; in the case of region nets, liaison with their proper area nets; in the case of area nets, liaison with other area nets through regularly-assigned functions in the Transcontinental Corps.

3) Net control station.

Certification in the Transcontinental Corps is available through the TCC area director on completion of at least three months of regular performance of an assigned function.

Net managers (or TCC directors) may use their discretion in "excusing" any station working for a certificate if that station is unable to perform its regular duty in any specific instance. Net managers (or TCC directors) shall be the sole judges as to whether a duty, even though performed regularly, is performed adequately to merit certification.

Special Liaison Method. Often managers at region and area levels will find that while one section or region can send few or no liaison stations, others have sufficient personnel to send several. In such cases, it is possible and perfectly permissible for the higher-level manager to propose to the lower-level manager to arrange that any excess personnel be used to effect liaison not being properly performed through lack of available

stations. *Example:* The manager of the Umpth Region Net finds that many stations are available to represent Section A in his region, but Section B is seldom represented. He contacts the manager of the Section B Net and proposes that a Section A station be sent to the early meeting of Section B to take its "thru" (out of section) traffic. This station then brings such traffic to the Umpth Region Net to be distributed among net stations as required. Also, a Section A station in URN may be designated to receive all Section B traffic; this station then reports into the Section B Net to clear this traffic. Both receiving and sending functions must be completed for full representation.

The above is an alternative method of getting the traffic through and is under no circumstances to be used in preference to having a station from the section itself report to the region net. Normally, liaison of a lower-echelon net to a higher-echelon net is the responsibility of the manager of the lower-echelon net.

Operating in Emergencies

The National Traffic System is dedicated to communications during emergencies on behalf of ARES, as well as the daily handling of routine third party traffic. When an emergency situation arises, NTS goes into complete or partial emergency operation depending entirely on the extent of the emergency situation and the extent of its effect. The normal cycles are expanded as required by the situation, so that more traffic can be handled and so that it can be handled more rapidly. In the extreme case, the cycles can operate continuously, with required representation present in all nets continuously, stations designed for this function replacing each other as others are dispatched to the higher or lower nets with which they make liaison.

The question arises: who alerts or activates NTS nets in an emergency and who determines which net or nets should be activated? ARRL emergency coordinators in disaster areas determine the communications needs and make decisions regarding the disposition of *local* communications facilities, in accordance with the need and in complete coordination with agencies to be served. Section emergency coordinators study the situation on a section-wide basis and make recommendations to the section traffic manager and/or NTS managers at section and/or region levels.

While the EC is, in effect, the manager of NTS nets operating at local levels, and therefore makes decisions regarding their activation, managers of NTS nets at section, region and area levels are directly responsible for activation of their nets in an emergency situation, at the behest of and on the recommendation of ARES or NTS officials at lower levels. The following "check lists" apply to officials at the levels indicated:

Section Traffic Managers, Section Net Managers. (1) You may be contacted in any emergency by the SEC, to activate your section nets, whether NTS or not, either to provide section-wide contact or, in the case of NTS nets, to provide liaison with the "outside". Have some means of activating your net(s) at any time. We suggest that you make it understood in your net that in the event of an emergency, net stations monitor the net frequency. Some net stations, at locations badly needed, can be activated by telephone if need be and if available.

(2) Make contact with your region net managers (NTS) in the event communications connected with the emergency transcend section boundaries, recommending extraordinary activation of the region NTS net. Thus, have some prearranged method of contacting him for this purpose.

(3) Designate net stations to conduct liaison with the NTS region net, either through another section net or direct. This is *your* responsibility, not that of the region net manager.

NTS Region Net Managers. (1) Any one of the NTS section net managers in your region may contact you should an emergency situation develop. Try to predict such contact on the basis of circumstances and be available to receive their recommendations.

(2) Make contact with your area net manager (NTS) in the event communications connected with the emergency transcend region boundaries, recommending extraordinary activation of the area NTS net. Thus, have some prearranged method of contacting him for this purpose.

(3) It is *your* responsibility to see that the region is represented in any extraordinary session of the area net, in addition, of course, to all regular sessions.

NTS Area Net Managers. There are only six of these, but their function in emergencies is of paramount importance.

(1) Maintain a high sensitivity to emergencies in your area which extend or may extend beyond region boundaries. When one does, *take the initiative* to alert the region net

manager involved to determine if extraordinary NTS operation is indicated.

(2) In the event high precedence inter-area traffic is involved, contact the TCC director in your area and make arrangements to clear the traffic to other areas.

(3) Contact other NTS area net managers to confer on possibilities of their having extra net sessions if deemed required to handle the traffic reaching them through NTS inter-area handling. Under some circumstances, direct representation or "hot lines" may be indicated.

(4) Maintain close contact with all region net managers in your area and make decisions regarding overall NTS operation in consultation with them.

Transcontinental Corps Directors. These NTS officials will be involved only where high-precedence traffic is to be handled between NTS areas.

(1) Be ready to alert your TCC crew and set up special out-of-net schedules as required.

(2) You may be called upon by the area net manager to set up "hot line" circuits between key cities involved in heavy traffic flow. Bear in mind which of your TCC stations are located in or near enough to large cities to man such circuits.

A diagram of the NTS alerting plan is depicted in Figure 7.

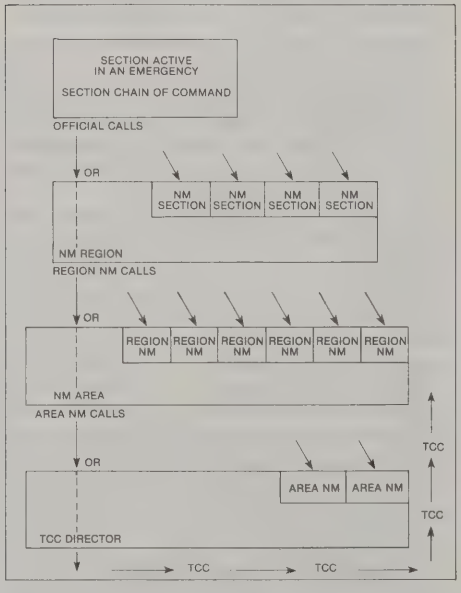

Fig. 7 — NTS alerting plan.

General Policy. NTS operators should be self-alerting to emergency conditions that might require their services, and should report into an appropriately-assigned net or other function without being specifically called upon. That is, the assignment should have been worked out with your net manager *in advance.* Each NTS operator should ask himself: "What is my emergency assignment? If I hear of an emergency condition, what should I do?" If he cannot answer the question, he should seek an answer to it through his net manager. It may be as simple as "report into the X Net on X frequency"; or, if the operator concerned is one of highly specialized, it might be "report to your TCC director in the X net on X frequency for a special assignment." Such an assignment might be an extra TCC function, or it might be as a functionary in a "hot line": point-to-point circuit needing special abilities or equipment.

Flexibility is needed, but a definite assignment pertaining to emergency operation is something that all NTS operators should have. If you don't have one, push the matter with your net manager. *NTS should be the front line of available Amateur Radio emergency communication,* especially for medium and long haul purposes.

Health and Welfare Traffic. One of the biggest problems in an emergency is the handling of so-called "health and welfare" traffic or "disaster welfare inquiries." The ARRL-recommended precedence for this type of traffic is W or "Welfare," and refers to either an inquiry as to the health and welfare of an individual in the disaster area or an advisory from the disaster area that indicates all is well. Inevitably, the influx of W traffic into the disaster area will be large, and NTS will be called upon to assist with this overload. The NTS policy with respect to the handling of W traffic is to handle as much of it as possible, but to adhere to its precedence. Higher-precedence traffic must be handled first, W traffic only when the circuit is free. Routine (R) traffic is not normally handled by an NTS net operating under emergency conditions, because usually they more than have their hands full with higher precedences, but should an emergency circuit be temporarily available, there is no reason why it can not be handled until the circuit again becomes occupied with higher precedence traffic.

In a widespread emergency system it is seldom possible to handle all the "Welfare" traffic with efficiency and dispatch. Sometimes, in fact, such traffic piles up

alarmingly, to the extent that much of it is never delivered. There are a number of ways in which this can be controlled, but few of them are consistent with public relations objectives. The best way to handle such situations is to maintain close contact with the Red Cross or the Salvation Army as appropriate, since most inquiries are handled through these organizations. Civil preparedness organizations also can often set up procedures for handling such traffic. In the past, special RTTY (or ASCII) circuits have been established, with great success. *Until or unless means for handling such traffic are established, it is usually wisest not to accept it* from the general public, or to do so only with an explicit understanding that chances of delivery are not guaranteed.

APPENDIX I — NTS NET PROCEDURES

The following procedures are recommended as an NTS standard and should be used by NTS nets. Deviations from it are made at the discretion of the net manager in cognizance of either necessity or desirability arising out of extraordinary circumstances, but always as a temporary expedient until standard procedure can be resumed.

(a) *General.* The following procedures apply to all NTS nets:

(1) The net control station (NCS) transmits a CQ plus the net designation promptly at the net meeting time.

(2) Stations reporting in indicate their function or the destination(s) for which they can take traffic, followed by the list of traffic on their hook, if any.

(3) Time-consuming pleasantries and other superfluous matter are not to be a part of the procedure while the net is in session.

(4) Net stations follow the direction of the NCS without question or comment if such directions are understood.

(5) Explanations of any kind are not transmitted unless they are absolutely essential to the net's conduct.

(6) Stations reporting into a net are held for 15 minutes, after which they are excused if there is no further traffic for them at that time. Others are excused (QNX) as soon as there is no further traffic for them or, unless in an emergency, at the regular net closing time. Stations in the net do not leave the net without being excused and do not ask to be excused unless absolutely necessary.

(7) All nets follow the general precepts of net operation outlined in the ARRL booklet *Operating An Amateur Radio Station,* and the publication *The ARRL Operating Manual.*

(b) *Section Nets.* The random call-up method should be used in most cases. The clearing of traffic should commence as soon as stations reporting in the net have traffic for each other, rather than waiting until all stations have reported in. The use of side frequencies (QNY) should be used extensively. The QNA procedure (stations answering in pre-arranged order) should only be used in times of traffic overload, or for acknowledging the region net representatives at the beginning of the net.

The following additional procedures are used in Section Nets:

(1) Stations reporting in to the net with traffic, list the destination city first, then the number of messages for that city. *Example* — "W2RQ DE AA2Z QTC Paterson 1 AR" Traffic destined outside the section is designated "through" (or "thru") followed by the number of "thru" messages. "Thru" traffic can also be listed for the appropriate region net.

(2) The region net representative is selected beforehand by the section net manager, but nevertheless indicates his purpose in reporting in. *Example* — "W2RQ DE W2UEZ 2RN TX QRU AR."

(3) Stations do not list their traffic until first recognized by the NCSs.

(4) If a particular city for which there is traffic is not represented on the net, the NCS may inquire who will handle such traffic (QNW), direct that it be sent to the station who can take it to a 2-meter local net for delivery, or who is nearest the destination, or that it be mailed. In any case, there should be a minimum of discussion, particularly if traffic is heavy.

(c) *Region Nets.*

(1) Stations reporting in indicate the *section* they came from if they are officially reporting for that purpose of handling traffic to or from that section. If their function is limited to sending or receiving, they should so indicate; otherwise the NCS will assume the station will do both.

(2) Traffic for destinations in the region are reported by *section.* If the destination is outside the region, the traffic should be designated "thru" or for the area net. *Example* — "W9JUJ DE W9QLW QIN QTC WIS

3 ILL 2 CAN 2 AR." This tells the NCS that W9QLW represents the Indiana section (QIN), and has traffic.

(3) The area net liaison station (designated beforehand by the region net manager) receives all traffic designated for the area net.

(4) Stations reporting in who are not authorized section representatives or liaisons simply indicate the traffic they have to send. If they do not have any traffic, they are immediately excused by the NCS, unless they can provide an outlet not available on the net through regular NTS channels.

(5) In the event a particular section is not represented in the region net, the NCS will use a special liaison method (see page) or any alternative channel available for clearing traffic to that section.

(6) In some cases it may be feasible to set up liaison between daytime and evening region nets. Such liaison can be useful for transferring "thru" traffic in a second session to a first session net. *Example:* The second daytime session of the Fifth Region Net receives a message destined for Chicago, which is in the Ninth Region. Normally, the message would be transferred to an evening section net to go through the evening cycle to its destination. Liaison with the early evening region net will eliminate a couple of these relays and work no hardship on the system.

(d) *Area Nets.*

(1) Stations reporting in indicate traffic by *region* if it is destined for a region within that area, by *area* if it is destined to a point outside that area. All stations reporting in with assigned receive functions indicate for which region in the area or for which other area they are authorized to receive traffic. *Example* — "WØAM DE W5GHP RN5 TX QTC 9RN 4 TEN 2 EAN 3 PAN 4 AR."

(2) The TCC representative designated to take traffic for another area so indicates in his QNI (check-in). *Example* — "K2KIR DE W1NJM PAN QRU AR." This tells the NCS, K2KIR, that W1NJM will take any traffic destined to the Pacific Area and that he himself has no traffic.

(e) *Send and Receive Stations.* Many NTS nets have adopted the procedure of sending more than one representative to the next-higher NTS echelon — one to take the traffic up and report it in, another to receive traffic from the upper echelon and bring it back. More than one transmit or receive liaison may be provided if traffic load is heavy and the personnel available is sufficient. It is perfectly permissible, and has many advantages in overload conditions, to the NCS and the net, for traffic both going and coming to be divided among two or more liaison stations.

Representatives who do not indicate which function they are performing will be assumed to be ready to perform both transmit and receive functions, at the discretion of the NCS. To indicate which you are performing, on cw send RX or TX after your QNI; on phone, say "receive only" or "transmit only," or "both."

The above procedure is not mandatory but is exemplary of what we are trying to accomplish in NTS. All net managers are urged to abide by it as closely as possible so that NTS procedure will be standard throughout the systems.

(f) *Miscellaneous.*

(1) When "QNY procedure" (dispatching stations to clear traffic on an adjacent or different frequency) is used, the station designated to *receive* traffic should call first, after zeroing on a spot near the QNY point comparatively free of QRM. When a two-way exchange is to be made, the station named first by the NCS is to call first.

(2) In QNY procedure, (which should be used whenever traffic is heavy, if possible), the frequency designated by the NCS is not intended to be exact. NTS stations using this procedure will be careful not to disrupt other traffic nets or ongoing QSOs by carelessly plopping down and starting to call on the frequency. If QRM is heavy on the spot designated by the NCS, it is expected stations will attempt to find a spot nearby on which to clear their traffic rather than returning to net frequency without having cleared it.

(3) It is not the policy for NTS nets to insist on a clear channel. Other stations operating on the frequency of an NTS net have a perfect right to be there. Net control stations should not request such stations to move. If the net frequency is occupied at net starting time, NCS should call the net on a nearby clear channel.

II — ARRL PRECEDENCES AND HANDLING INSTRUCTIONS

All messages handled by Amateur Radio should contain precedences — that is, an evaluation of each message's importance, made by the originating station. A precedence is an "order of handling." There are four precedences in the ARRL message form: Emergency, Priority (P), Welfare (W) and Routine (R), *in that order of handling.* When and as they appear on a net or any other kind of circuit, messages will be handled in this order.

EMERGENCY - Any message having life and death urgency to any person or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be *very rare.* On cw/RTTY, this designation will *always* be spelled out. When in doubt, do not use it.

PRIORITY - Use abbreviation *P* on cw/RTTY. This classification is for a) important messages having a specific time limit b) official messages not covered in the emergency category c) press dispatches and emergency-related traffic not of the *utmost* urgency d) notice of death or injury in a disaster area, personal or official.

WELFARE - This classification, abbreviated as *W* on cw/RTTY, refers to either an inquiry as to the health and welfare of an individual in the disaster area or an advisory from the disaster area that indicates all is well. Welfare traffic is handled only after all emergency and priority traffic is cleared. The Red Cross equivalent to an incoming Welfare message is DWI (Disaster Welfare Inquiry).

ROUTINE - Most traffic in normal times will bear this designation. In disaster situations, traffic labeled Routine (*R* on cw/RTTY) should be handled last, or not at all when circuits are busy with higher precedence traffic.

The precedence will follow, *but is not a part of,* the message number. For example, a message may begin with NR 207 R on cw, "Number Two Zero Seven, Routine" on phone.

Handling instructions (HX) are less-used but quite useful in handling messages. They serve to convey any special instructions to handling and delivering operators. This "prosign," when used, is inserted in the message preamble between the precedence and the station of origin. Its use is *optional* with the originating stations, but once inserted is *mandatory* with all relaying stations. The following definitions apply:

HXA — (Followed by number.) Collect landline delivery authorized by addressee within miles. (If no number, authorization is unlimited.)

HXB — (Followed by number.) Cancel message if not delivered within . . . hours of filing time; service originating station.

HXC — Report date and time of delivery (TOD) to originating station.

HXD — Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.

HXE — Delivering station get reply from addressee, originate message back.

HXF — (Followed by number.) Hold delivery until . . . (date).

HXG — Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.

Example: NR 207 R HXA50 W4MLE 12 . . . (etc.).

If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated thus: NR 207 R HXAC W4MLE . . . (etc.) But NR207 R HXA50 HXC W4MLE . . . (etc.). One phone, use phonetics for the letter or letters following the HX, to insure accuracy.

III — OPERATION OF THE TRANSCONTINENTAL CORPS

The purpose of the Transcontinental Corps (TCC) is to relay traffic from one NTS area to another, conducting liaison with NTS area nets to do so. Administratively, the TCC is divided into Cycle Two and Cycle Four functions, and each cycle has specific functionaries under the supervision of a TCC director.

The function of the TCC director is to assign functions, centralize activity and file

status reports each month to ARRL headquarters. There are six TCC directors, two for each area.

TCC functions are performed in several ways, according to circumstances. In all but two cases, the method used is an out-of-net schedule between TCC counterparts of different areas to effect the exchange of traffic from area to another. The exceptions are Station A and L; these stations report directly into the Central Area Net with traffic from the Eastern Area to the Central Area, since there is no time between these two area net meetings for an out-of-net schedule.

Times and frequencies of the other 20 schedules are worked out by the TCC directors working together and are arranged in accordance with time available, propagation conditions, stations available and other factors, always with the objective of the best service possible on an organized, systematic basis.

TCC stations must have the following qualifications: (1) Adequate signal power to perform the job to be done; normally inputs of under 100 watts can not accomplish it unless a very efficient antenna system is used. (2) The highest caliber of operating ability and NTS net savvy. (3) Capability both personally and equipment-wise to keep the required schedules.

A TCC station normally performs only one TCC function per week. On other days of the week, other stations perform the same function. TCC operates on a seven-day-per-week basis. Each function consists of two steps, as follows (all times in UTC):

Station Function

A. 1. Normally located in the *Eastern* Area, this station reports into Eastern Area Net (EAN) at 0130, receives all traffic for Central Area (CAN).
   2. Reports into Central Area Net (CAN) the same night at 0230, distributes the traffic upon direction of the CAN control station.

B. 1. Normally located in the *Eastern* Area, this station reports into Eastern Area Net (EAN) at 0130, receives all traffic for the Pacific Area (PAN).
   2. Keeps a schedule with *Station H* some time between 0230 and 0430 and sends this traffic to him.

C. 1. Normally located in the *Central* Area, reports into Central Area Net (CAN) at 0230, takes all traffic for the Eastern Area (EAN).
   2. Keeps a schedule with *Station K* some time after 0330 and sends this traffic to him.

D. 1. Normally located in the *Eastern* Area, this station keeps a schedule with *Station J* some time between 0530 and 1930 to receive traffic for the Eastern Area.
   2. Sends this traffic into destination Section, Region or the Eastern Area Net (EAN) at first opportunity.

E. 1. Normally located in the *Central* Area, this station reports into Central Area Net (CAN) at 0230, receives all traffic for Pacific Area (PAN).
   2. Keeps a schedule with *Station G* between 0330 and 0430 and sends this traffic to him.

F. 1. Normally located in the *Central* Area, this station keeps a schedule with *Station I* between 0530 and 2030 to receive for the Central Area.
   2. Sends this traffic into destination Section, Region or the Central Area Net as soon as possible after received.

G. 1. Normally located in the *Pacific* Area, this station keeps a schedule with *Station E* between 0330 and 0430 to receive traffic for the Pacific Area (PAN).
   2. Reports into the Pacific Area Net (PAN) at 0430 to distribute this traffic under direction of the PAN control station.

H. 1. Normally located in the *Pacific* Area, this station keeps a schedule with *Station B* between 0230 and 0430 to receive traffic for Pacific Area (PAN).
   2. Reports into the Pacific Area Net at 0430 to distribute this traffic under direction of the PAN control station.

I. 1. Normally located in the *Pacific* Area, this station reports into the Pacific Area Net (PAN) at 0430 to receive traffic for the Central Area (CAN).
   2. Keeps a schedule with *Station F* between 0530 and 2030 to send this traffic.

J. 1. Normally located in the *Pacific* Area, this station reports into the Pacific Area Net (PAN) at 0430 to receive traffic for the Eastern Area (EAN).
   2. Keeps a schedule with *Station D* between 0530 and 1930 to send this traffic.

K. 1. Normally located in the *Eastern* Area, this station keeps a schedule with *Station C* between 0330 and 1930 to receive traffic for Eastern Area (EAN).

2. Sends this traffic into destination Section, Region or the Eastern Area Net as soon as possible after received.

L. 1. Normally located in the *Eastern* Area, this station reports into Eastern Area Net (EAN) at 1930, receives all traffic for Central Area (CAN).
2. Reports into Central Area Net (CAN) at 2030, distributes the traffic upon direction of the CAN control station.

M. 1. Normally located in the *Eastern* Area, this station reports into Eastern Area Net (EAN) at 1930, receives all traffic for the Pacific Area (PAN).
2. Keeps a schedule with *Station S* some time between 2030 and 2230 and sends this traffic to him.

N. 1. Normally located in the *Central* Area, reports into Central Area Net (CAN) at 2030, takes all traffic for the Eastern Area (EAN).
2. Keeps a schedule with *Station V* some time after 2130 and sends this traffic to him.

O. 1. Normally located in the *Eastern* Area, this station keeps a schedule with *Station U* some time between 2330 and 0130 to receive traffic for the Eastern Area.
2. Sends this traffic into destination Section, Region or the Eastern Area Net (EAN) at first opportunity.

P. 1. Normally located in the *Central* Area, this station reports into Central Area Net (CAN) at 2030, receives all traffic for Pacific Area (PAN).
2. Keeps a schedule with *Station R* between 2130 and 2230 and sends this traffic to him.

Q. 1. Normally located in the *Central* Area, this station keeps a schedule with *Station T* between 2330 and 0230 to receive traffic for the Central Area.
2. Sends this traffic into destination Section, Region or the Central Area Net as soon as possible after received.

R. 1. Normally located in the *Pacific* Area, this station keeps a schedule with *Station P* between 2130 and 2230.
2. Reports into the Pacific Area Net (PAN) at 2230 to distribute this traffic under the direction of the PAN control station.

S. 1. Normally located in the *Pacific* Area, this station keeps a schedule with *Station M* between 2030 and 2230 to receive traffic for Pacific Area (PAN).
2. Reports into the Pacific Area Net at 2230 to distribute this traffic under the direction of the PAN control station.

T. 1. Normally located in the *Pacific* Area, this station reports into the Pacific Area Net (PAN) at 2230 to receive traffic for the Central Area (CAN).
2. Keeps a schedule with *Station Q* between 2330 and 0230 to send this traffic.

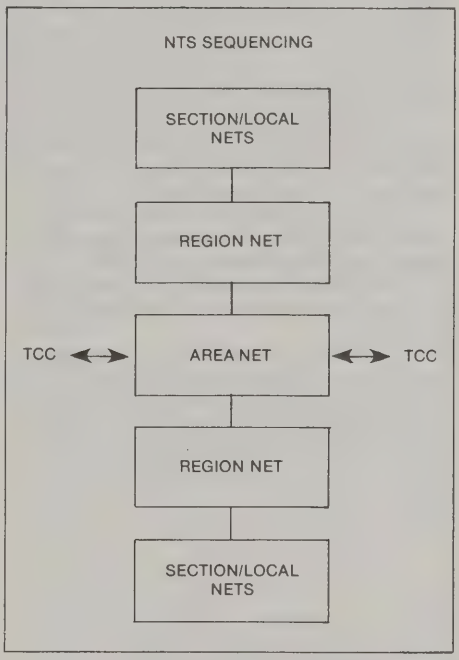

Fig. 8 — Block Diagram of NTS Sequencing

U. 1. Normally located in the *Pacific* Area, this station reports into the Pacific Area Net (PAN) at 2230 to receive traffic for the Eastern Area (EAN).
2. Keeps a schedule with *Station O* between 2330 and 0130 to send this traffic.

V. 1. Normally located in the *Eastern* Area, this station keeps a schedule with *Station N* between 2130 and 0130 to receive traffic for Eastern Area (EAN).
2. Sends this traffic into destination Section, Region or the Eastern Area Net as soon as possible after received.

Functions A, B, C, E, G, H, I, J, O, Q, V, have been assigned to the Cycle Four TCC director, while Functions D, F, K, L, M, N, P, R, S, T, U, have been designated the responsibility of the Cycle Two TCC director.

The following is an example to show how traffic is or can be routed on the National Traffic System. In each case, perfect (ideal) operating conditions and 100% adherence to system as previously outlined are assumed.

(a) This example demonstrates how a message originating in South Carolina finds its way to Los Angeles in the evening cycle. K4ZB is an amateur in South Carolina who has been asked to originate a message to Los Angeles. All times are UTC, assuming local standard time is being observed throughout.

(1) W4ABC reports the message into the South Carolina Section Net at 0000 and transmits it to W4ANK, the station designated to take traffic to 4RN.

(2) W4ANK takes the message to 4RN at 0045, gives it to KB4N, the station designated to take traffic to EAN.

(3) KB4N reports the message into EAN at 0130, gives it to W3PQ, who is TCC Station B.

(4) W3PQ keeps a TCC out-of-net schedule with N6WP (TCC Station H) and sends him the message. This is a transcontinental hop, but the two stations involved may pick any frequency or mode in any band. The exchange must have been completed by 0430, when PAN meets.

(5) N6WP reports the message into PAN at 0430, gives it to W6JXK, the RN6 (receive) representative.

(6) W6JXK reports the message into RN6 at 0530, gives it to W6INH, the Los Angeles Section representative.

(7) W6INH reports it into Southern Calif. Net at 0600, gives it to K6INK, the Los Angeles station nearest the destination.

(8) K6INK can telephone or otherwise deliver the message to the addressee upon receipt. The message originated in South Carolina at 0000, was delivered in LA at about 0630.

In addition to the NTS routing system, wide-coverage independent nets, independent regions nets (covering more than one section) and direct connections to key cities in foreign countries are also available. These key cities, usually accessed through the independent nets, have been especially valuable in assisting emergency communications in Central and South America. The independent nets take on a wide variety of types and forms with many of the most ac-

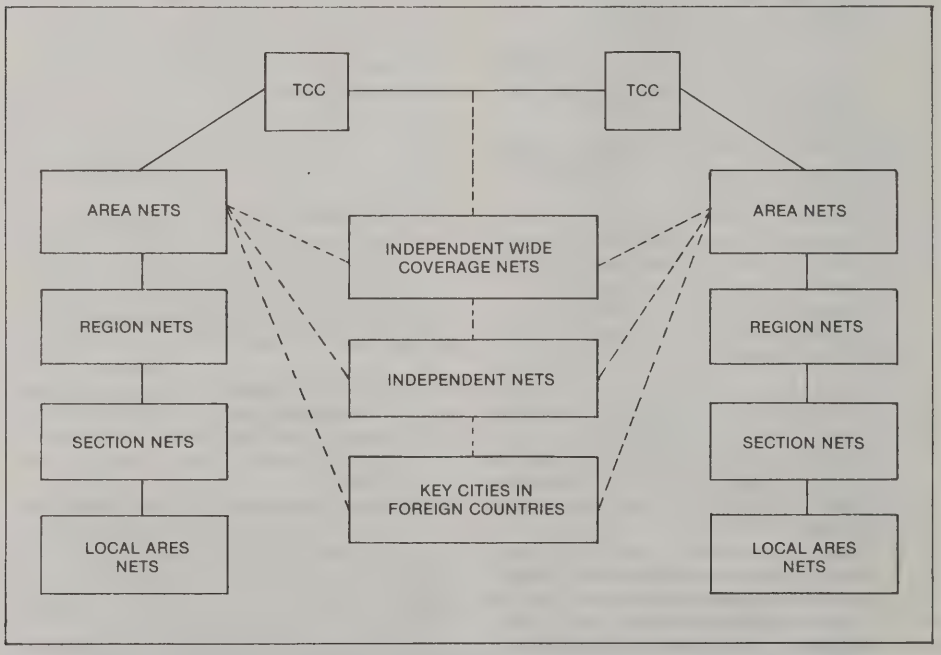

Fig. 9 — Emergency communications through linked nets.

tive heard daily on 40 and 20 meters. The 20-meter nets are especially important in covering the areas of the Caribbean and South America.

Fig. 9 shows the traffic reaching these independent nets through the higher levels of NTS, i.e. from liaison out of either the area nets or TCC. The reasoning for this is simply that stations who operate in the area nets and in TCC have the most "savvy" and experience. They know which nets meet when and the best modes of routing traffic into or out of certain areas. Further, in times of emergency, the net managers at this level maintain contact with ARRL hq. and are thus aware of any special arrangements that have been made regarding traffic routing.

V — COUNTING NET TRAFFIC

The basic count for traffic handled in nets is one point for each time a message in standard ARRL form is *transmitted and received* during a net session, at the direction of the net control station. This has nothing to do with the individual station traffic count. In a net count there is no breakdown of originated, received, sent and delivered traffic as there is for individual stations. The count is the number of message *handlings* accomplished during the net's directed sessions.

This is simple enough, yet there seems to be considerable confusion about it. A few examples may be helpful:

Example 1: Upon conclusion of his directed net, a NCS operator finds that there were 23 messages reported into the net and that 20 of these were "cleared" — that is, at his direction transmitted by the station holding them and receipted for by the station receiving them. The "net" traffic count for this net session was therefore 20. It makes no difference to the net count whether the messages were originals with the transmitting station, whether he is relaying them, whether they are addressed to the receiving station, delivered by the latter or relayed by him. All the net is concerned with is *handling* them, from one station to the other. Note that the net does not get credit for traffic reported, only for traffic *cleared.*

Example 2: Net control must base his count on the figures reported to him by net stations. Thus, if a station reporting into the net says he has five messages and later succeeds in clearing them at net control's direction, the net gets credit for handling five messages. However, suppose net control dispatches this station and the station to receive the messages to a side frequency to clear them, then closes the net five minutes later. How does he know whether the traffic was successfully cleared, or *how many* were cleared.

Well, he doesn't, unless he checks; if so, he can enter the exact count. Otherwise, knowing the ability of the two operators concerned, he can *estimate* what proportion of the traffic was cleared. It is not considered ethical to QNY large amounts of traffic just prior to closing a net and counting all such traffic as having been cleared during QND.

Example 3: "Book" messages should be reported into the net *not* as books, but in accordance with the count they will earn when handled. Thus a book of four messages is reported in not as "QTC book of 4," but as "QTC 2," followed by the destination. This assumes that they are all to be sent to the same station. If they are to be sent to different stations, the "book" should be broken down and the resulting separate messages reported in as such rather than as books.

Don't waste valuable net time fussing about the count. The important thing is to get the traffic handled!

VI — INDIVIDUAL TRAFFIC COUNT

As already mentioned, the individual's traffic count does not have any correlation to the net's traffic count; it is a separate count that each traffic handler should report to his/her SCM (see page 8, any *QST*) each month. Traffic totals are included in the SCM's monthly report to ARRL headquarters, which is published in *QST* under the heading of "Section Activities." Here are the definitions of each message category:

Originated — One point for each message from a third party for sending via your station. This "extra" credit is given for an off-the-air function because of the value of contact with the general public.

Sent — Every message sent over the air from your station to another amateur receives a point in this category. Thus, a message that is eligible for an *Originated* point as above receives another point when it is sent on the air. Likewise, a message that is received on the air gets a *Sent* point when it is relayed to another station. A message that you initiate yourself, while it gets no *Originated* point, gets a *Sent* point when cleared. All *Sent* points require on-the-air sending.

Received — A message received over the air gets a *Received* point, whether received for relaying (sending) or for delivery to the addressee. Any message received which is *not* eligible for a *Delivery* point (such as one addressed to yourself) is nevertheless eligible for a *Received* point.

Delivered — The act of delivery of a message to a third party receives a point in this category, in addition to a *Received* point. This is strictly an *off-the-air* function and must be coupled with receipt of the message at your station. Thus you can't get a *Delivered* point unless you first get a *Received* point.

VII — SECTION LEADERSHIP JOB DESCRIPTIONS

The section communications manager (SCM), who is elected by the ARRL members in the section, makes all section-level leadership appointments. Your SCM's name, address and phone number appear on page 8 of every issue of *QST*, for those wishing to volunteer for one of these important positions. Here is a description of the responsibilities of the SEC, STM, DEC and EC:

SEC — There is only one section emergency coordinator appointed in each section. His/her duties are

1) To encourage all groups of community amateurs to establish a local emergency organization.

2) To recommend to the SCM action on all section emergency policy and planning, including the development of a section emergency-communications plan.

3) To cooperate and coordinate with the section traffic manager so that emergency nets and traffic nets in the section present a united public-service front.

4) To recommend to the SCM candidates for emergency coordinator and district emergency coordinator appointments (and cancellations), and determination of areas of jurisdiction of each amateur so appointed. Note that the SEC does not make (or cancel) appointments; he or she simply recommends them to the SCM.

5) To promote ARES membership drives, meetings, activities, tests, procedures, etc., at the section level.

6) To collect and consolidate emergency coordinator (or district emergency coordinator) monthly reports and submit monthly progress summaries to ARRL headquarters.

7) To maintain contact with other communications services and liaison at the section level with all agencies served in the public interest, particularly in connection with state and local government, civil defense, Red Cross, Salvation Army and the National Weather Service.

8) Full ARRL membership and a general class license (Amateur Grade in Canada) or higher required.

STM — There is only one section traffic manager appointed for each section. His/her duties are as follows:

1. Establishment, administration and promotion of a traffic-handling program at the section level.

2. Cooperation and coordination with the section emergency coordinator so that traffic nets and emergency nets in the section present a united public service front.

3. Recommendations of candidates for net manager to the SCM.

4. Ability and familiarity with proper traffic handling procedures in two or more different modes.

5. Collection of net manager monthly reports for submission to ARRL headquarters.

6. Full ARRL membership and a General class license (Amateur Grade in Canada) or higher required.

DEC — The district emergency coordinator is appointed by the SCM, in concert with the SEC, to supervise a district of EC jurisdictional units. The duties of the DEC are to

1) Coordinate the training, organization and emergency participation of emergency coordinators in the area of jurisdiction.

2) Make local decisions in the absence of the SEC or through coordination with the SEC concerning the allotment of available

amateurs and equipment during an emergency.

3) Coordinate the interrelationship between local emergency plans and between communications networks within the area of jurisdiction.

4) Act as backup for local areas without an emergency coordinator and assist in maintaining contact with governmental and other agencies in the area of jurisdiction.

5) Provide direction in the routing and handling of emergency communications of either a formal or tactical nature.

6) Recommend EC appointments to the SEC and SCM and advise on OES appointments.

7) Coordinate the reporting and documentation of ARES activities in the area of jurisdiction.

8) Act as a model emergency communicator as evidenced by dedication to purpose, reliability and understanding of emergency communications.

The local emergency coordinator (EC) is in charge of a smaller geographical area than the DEC. The responsibilities of an EC are to

1) Coordinate the training, organization and emergency participation of interested amateurs in the area of jurisdiction.

2) Establish an emergency-communications plan for the area that will effectively utilize the group to cover the needs for both tactical and formal message traffic requirements.

3) Establish a viable working relationship with governmental and other agencies who might need the service of ARES (e.g., Red Cross, Salvation Army, Rescue Squads, Weather Service, Hospitals, Police Department and Fire Department).

4) Establish local communications networks run on a regular basis and periodically test these networks by drills.

5) Establish an emergency traffic plan utilizing NTS to the extent possible and coordinate liaison with NTS nets.

6) In times of disaster, evaluate the communications needs of the jurisdiction and respond quickly to those needs.

7) Do all that is possible to further the image of Amateur Radio by dedication to purpose, reliability and a thorough understanding of the mission of Amateur Radio.

VIII — UNITED STATES AND CANADA THIRD-PARTY TRAFFIC AGREEMENTS

THIRD-PARTY TRAFFIC AGREEMENTS

The United States has made special arrangements to permit U.S. amateurs to exchange third-party traffic with amateurs licensed by any of these 28 other countries:

North America: Canada, Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama.

South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela.

Europe: 4UIITU — Geneva

Asia: Israel, Jordan

Africa: Ghana, Liberia

Canada has made special arrangements to permit Canadian amateurs to exchange third-party traffic with amateurs licensed by any of these 19 countries:

North America: Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, United States

South America: Bolivia, Chile, Colombia, Guyana, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela

Europe: No countries.

Asia: Israel

Africa: No countries

State/Province	*Abbrev.*	*Region*	*Area*
Alaska	AK	7	PAN
Alabama	AL	5	CAN
Alberta	AB	7	PAN
Arizona	AZ	12	PAN
Arkansas	AR	5	CAN
British Columbia	BC	7	PAN
California	CA	6	PAN
Colorado	CO	12	PAN
Connecticut	CT	1	EAN
Delaware	DE	3	EAN
District of Columbia	DC	3	EAN
Florida	FL	4	EAN
Georgia	GA	4	EAN
Guam	GU	6	PAN
Hawaii	HI	6	PAN
Idaho	ID	7	PAN
Illinois	IL	9	CAN
Indiana	IN	9	CAN
Iowa	IA	10	CAN
Kansas	KS	10	CAN
Kentucky	KY	9	CAN
Labrador	LB	11	EAN
Louisiana	LA	5	CAN
Maine	ME	1	EAN
Manitoba	MB	10	CAN
Maryland	MD	3	EAN
Massachusetts	MA	1	EAN
Michigan	MI	8	EAN
Minnesota	MN	10	CAN
Mississippi	MS	5	CAN
Missouri	MO	10	CAN
Montana	MT	7	PAN
Nebraska	NE	10	CAN
Nevada	NV	6	PAN
New Brunswick	NB	11	EAN
New Hampshire	NH	1	EAN
New Jersey	NJ	2	EAN
New Mexico	NM	12	PAN
New York	NY	2	EAN
Newfoundland	NF	11	EAN
North Carolina	NC	4	EAN
North Dakota	ND	10	CAN
Nova Scotia	NS	11	EAN
Ohio	OH	8	EAN
Oklahoma	OK	5	CAN
Ontario	ON	11	EAN
Oregon	OR	7	PAN
Pennsylvania	PA	3	EAN
Prince Edward Island	PE	11	EAN
Puerto Rico	PR	4	EAN
Quebec	PQ	11	EAN
Rhode Island	RI	1	EAN
Saskatchewan	SK	10	CAN
South Carolina	SC	4	EAN
South Dakota	SD	10	CAN
Tennessee	TN	5	CAN
Texas	TX	5	CAN
Utah	UT	12	PAN
Vermont	VT	1	EAN
Virginia	VA	4	EAN
Virgin Islands	VI	4	EAN
Washington	WA	7	PAN
West Virginia	WV	8	EAN
Wisconsin	WI	9	CAN
Wyoming	WY	12	PAN
APO New York	APO NY	2	EAN
APO San Francisco	APO SF	6	PAN

W1AW

ARRL operates a Headquarters station using W1AW, the original call of its founding father, Hiram Percy Maxim; thus, it is often known as the Maxim Memorial Station. Many services are performed for the operating amateur over W1AW every day, including bulletins of information and latest news, code practice at speeds from 5 through 35 wpm, and certificate-qualifying runs, frequency measuring transmissions, etc. The complete W1AW operating schedule appears in April and October *QST*, and is also available on request from Headquarters with an s.a.s.e. Ask for CD-5.

IN A COMMUNICATIONS EMERGENCY

monitor W1AW for bulletins as follows: *Phone*, on the hour. *RTTY*, 15 minutes past the hour. *Cw*, on the half hour.

TIME CONVERSION TO UTC

EST	*UTC*	*CST*	*MST*	*UTC*	*PST*
1900	0000*	1800	1700	0000*	1600
2000	0100	1900	1800	0100	1700
2100	0200	2000	1900	0200	1800
2200	0300	2100	2000	0300	1900
2300	0400	2200	2100	0400	2000
0000*	0500	2300	2200	0500	2100
0100	0600	0000*	2300	0600	2200
0200	0700	0100	0000*	0700	2300
0300	0800	0200	0100	0800	0000*
0400	0900	0300	0200	0900	0100
0500	1000	0400	0300	1000	0200
0600	1100	0500	0400	1100	0300
0700	1200	0600	0500	1200	0400
0800	1300	0700	0600	1300	0500
0900	1400	0800	0700	1400	0600
1000	1500	0900	0800	1500	0700
1100	1600	1000	0900	1600	0800
1200	1700	1100	1000	1700	0900
1300	1800	1200	1100	1800	1000
1400	1900	1300	1200	1900	1100
1500	2000	1400	1300	2000	1200
1600	2100	1500	1400	2100	1300
1700	2200	1600	1500	2200	1400
1800	2300	1700	1600	2300	1500

Universal Coordinated Time (UTC) is the time at the zero or reference meridian. Time changes one hour with each change of 15° in longitude. EST, CST, MST and PST are 5, 6, 7 and 8 hours "earlier" than the time at the reference (0°) meridian. They correspond to 75th, 90th, 105th and 120th meridians.

* or 2400. (2400 is associated with the date of the day ending 0000 with the day just starting.)

Name: _____ Call: _____

AMATEUR RADIO EMERGENCY SERVICE

REGISTRATION FORM

Address: _____

City: _____ State/Prov.: _____ Zip/PC: _____

Bus. phone: _____ Home phone: _____ County: _____

License Class: _____ Primary radio interest: _____

Check (✓) bands/modes you can operate:

	160	80	40	20	15	10	6	2
CW								
FM								
RTTY								
SSB								
MOBILE								

Can your home station operate without commercial power& ( ) YES ( ) NO

If yes, what bands? _____

Signed: _____ Date: _____

ARRL ENDING SIGNALS

Meaning	*Phone*	*C W*	*Use*
End of transmission	Over	$\overline{AR}$	After call to a specific station, before contact has been established. Examples: Phone — W6ABC from W9LMN, over. C W — W6ABC DE W9LMN $\overline{AR}$
End of formal message	End of message	$\overline{AR}$	After transmission of a radiogram, following the signature.
Invitation to transmit (any station)	Go (ahead)	K	After CQ and at the end of a transmission during QSO when there is no objection to another station breaking in.
Invitation to transmit (specific station, *only*)	. . . only, Go	$\overline{KN}$	At the end of any transmission when only the specific station called or being contacted is invited to answer.
End of contact	Clear	$\overline{SK}$	At the end of a QSO. On c w, $\overline{SK}$ W8LMN DE W5BCD. On phone, W8LMN this is W5BCD clear.
Closing station	Clear and leaving the air	CL	When going off the air to indicate no calls will be listened for or answered. On phone, W7HIJ this is W2JKL, clear and leaving the air. On c w, W7HIJ DE W2JKL CL

CD-220 (6–79)

The American Radio Relay League, Inc.
225 Main Street
Newington, Connecticut 06111

IN AN EMERGENCY

Monitor your local emergency net frequency.
Make contact with your local EC or RO.
Take immediate steps to follow any prearranged plans.
Stay off the air unless or until you are *sure* you can be of assistance.
In widespread emergencies, monitor W1AW for latest bulletins and news.

TIME CONVERSION CHART

UTC	EDT/AST	CDT/EST	MDT/CST	PDT/MST	PST
0000*	2000	1900	1800	1700	1600
0100	2100	2000	1900	1800	1700
0200	2200	2100	2000	1900	1800
0300	2300	2200	2100	2000	1900
0400	0000*	2300	2200	2100	2000
0500	0100	0000*	2300	2200	2100
0600	0200	0100	0000*	2300	2200
0700	0300	0200	0100	0000*	2300
0800	0400	0300	0200	0100	0000*
0900	0500	0400	0300	0200	0100
1000	0600	0500	0400	0300	0200
1100	0700	0600	0500	0400	0300
1200	0800	0700	0600	0500	0400
1300	0900	0800	0700	0600	0500
1400	1000	0900	0800	0700	0600
1500	1100	1000	0900	0800	0700
1600	1200	1100	1000	0900	0800
1700	1300	1200	1100	1000	0900
1800	1400	1300	1200	1100	1000
1900	1500	1400	1300	1200	1100
2000	1600	1500	1400	1300	1200
2100	1700	1600	1500	1400	1300
2200	1800	1700	1600	1500	1400
2300	1900	1800	1700	1600	1500
2400*	2000	1900	1800	1700	1600

Universal Coordinated Time (UTC) is the time at the zero or reference meridian. Time changes one hour with each change of 15° in longitude. The five time zones in the U.S. proper and Canada roughly follow these lines.

*0000 and 2400 are interchangeable. (2400 is associated with the date of the day ending, 0000 with the day just starting.

THE AMERICAN RADIO RELAY LEAGUE, INC.
Newington, Conn.

ITU Phonetic Alphabet

Word list adopted by the
International Telecommunication Union

A	ALFA
B	BRAVO
C	CHARLIE
D	DELTA
E	ECHO
F	FOXTROT
G	GOLF
H	HOTEL
I	INDIA
J	JULIETT
K	KILO
L	LIMA
M	MIKE
N	NOVEMBER
O	OSCAR
P	PAPA
Q	QUEBEC
R	ROMEO
S	SIERRA
T	TANGO
U	UNIFORM
V	VICTOR
W	WHISKEY
X	X-RAY
Y	YANKEE
Z	ZULU

THE R-S-T SYSTEM

READABILITY

1 — Unreadable.
2 — Barely readable, occasional words distinguishable.
3 — Readable with considerable difficulty.
4 — Readable with practically no difficulty.
5 — Perfectly readable.

SIGNAL STRENGTH

1 — Faint signals, barely perceptible.
2 — Very weak signals.
3 — Weak signals.
4 — Fair signals
5 — Fairly good signals.
6 — Good signals.
7 — Moderately strong signals.
8 — Strong signals.
9 — Extremely strong signals.

TONE

1 — Sixty cycle a.c. or less, very rough and broad.
2 — Very rough a.c. very harsh and broad.
3 — Rough a.c. tone, rectified but not filtered.
4 — Rough note, some trace of filtering.
5 — Filtered rectified a.c. but strongly ripple-modulated.
6 — Filtered tone, definite trace of ripple modulation.
7 — Near pure tone, trace of ripple modulation.
8 — Near perfect tone, slight trace of modulation.
9 — Perfect tone, no trace of ripple or modulation of any kind.

If the signal has the characteristic steadiness of crystal control, add the letter X to the RST report. If there is a chirp, the letter C may be added to so indicate. Similarly for a click, add K. The above reporting system is used on both c w and voice, leaving out the "tone" report on voice. Turn card over for examples.

This handy operating aid is actually five aids in one. It can be posted at your operating position, reverse side out, or can be separated into each of its five sections and posted separately or kept near your log. This is another service of ARRL to the amateur operating fraternity.

THE AMERICAN RADIO RELAY LEAGUE, INC.
NEWINGTON, CT 06111

To All Radio Amateurs:

The list of "ending signals" on the reverse of this card has been arrived at after careful consideration of common and traditional usuage versus need and common sense. This is the use *recommended* by ARRL, of the various ending signals given.

Whether you operate phone or cw (RTTY can use the cw abbreviations) there are times when, upon standing by, you will find it desirable to indicate to anyone listening, who might want to "break in," just what the status is of the transmission he has just heard. Modern voice communication is "VOX" type and often requires no "ending signals," but voice equivalents of cw ending signals are included for convenience. Please help us popularize them.

American Radio Relay League, Inc.

THE AMERICAN RADIO RELAY LEAGUE, INC.
Newington, Connecticut

To: All Radio Amateurs:

Signal reporting is a courtesy, not an FCC requirement. It is such a common courtesy that every amateur has a space for it in his log and on his QSL card. It is the information most sought in practically any QSO.

The system outlined on the reverse of this card has achieved universal acceptance among c.w. operators, and is being more and more widely used by voice operators.

Be honest! If there is something wrong with the signal of the other fellow, tell him so, because he wants to know, just as you want to know if there is something wrong with yours. Make your reports worthwhile, honest and informative. Use the definitions!

Examples:

By cw: RST 359; RST 569X; RST 489C; **RST 579K.**

By voice: **I am receiving you Readability . . . (1-5), Strength . . . (1-9).**

Good Phone Operating

1. **Listen much . . . with care.** Avoid distractions in your operating room. Tune the band well after each call.
2. **Time your calls; monitor your own frequency.** Call only when a station is free.
3. **Make short calls, with breaks to listen.** Speak clearly, at a steady, modest rate. Three short calls are better than one long one.
4. **Use Vox or push-to-talk technique . . . speak near the mike.** Watch the modulation indicator. Keep local background noise at a minimum
5. **Make notes. Avoid missing points for comment.** Jot down topics to avoid repeats.
6. **Talk in connected thoughts and phrases.** Notes will help avoid mixing up subjects. Vox and push-to-talk techniques will help brother amateurs from calling you a monologuist.
7. **Speak naturally.** QSOs need not be cut and dried. Make them interesting. Avoid exhibitionism. Use proper operating form to promote efficiency in communication and add respect and prestige for your station.

To: All Radio Amateurs.

A phonetic alphabet or special word list is recommended to use in identifying station calls or difficult words as necessary.

The list helps to avoid facetious word combinations. This gives it greatest acceptability to all amateurs.

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CD-220 (6–79)

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1 — Faint signals, barely perceptible.
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Invitation to transmit (any station)	Go (ahead)	K	After CQ and at the end of a transmission during QSO when there is no objection to another station breaking in.
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CD-220 (6–79)

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To All Radio Amateurs:

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Be honest! If there is something wrong with the signal of the other fellow, tell him so, because he wants to know, just as you want to know if there is something wrong with yours. Make your reports worthwhile, honest and informative. Use the definitions!

Examples:

By cw: RST 359; RST 569X; RST 489C; RST 579K.

By voice: I am receiving you Readability . . . (1-5), Strength . . . (1-9).

Good Phone Operating

1. **Listen much . . . with care.** Avoid distractions in your operating room. Tune the band well after each call.
2. **Time your calls; monitor your own frequency.** Call only when a station is free.
3. **Make short calls, with breaks to listen.** Speak clearly, at a steady, modest rate. Three short calls are better than one long one.
4. **Use Vox or push-to-talk technique . . . speak near the mike.** Watch the modulation indicator. Keep local background noise at a minimum
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The chart on the other side has been arranged to show time zones used by most amateurs in the North American Continent and Universal Coordinated Time, used universally as a standard. The advantage of UTC is that it is the universally understood reference throughout the world. ARRL recommends that all amateur logging be done in UTC.

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End of formal message	End of message	AR	After transmission of a radiogram, following the signature.
Invitation to transmit (any station)	Go (ahead)	K	After CQ and at the end of a transmission during QSO when there is no objection to another station breaking in.
Invitation to transmit (specific station, *only*)	...only, Go	KN	At the end of any transmission when only the specific station called or being contacted is invited to answer.
End of contact	Clear	SK	At the end of a QSO. On c w, SK W8LMN DE W5BCD. On phone, W8LMN this is W5BCD clear.
Closing station	Clear and leaving the air	CL	When going off the air to indicate no calls will be listened for or answered. On phone, W7HIJ this is W2JKL, clear and leaving the air. On c w, W7HIJ DE W2JKL CL

CD-220 (6–79)

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2 — Barely readable, occasional words distinguishable.
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SIGNAL STRENGTH

1 — Faint signals, barely perceptible.
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2 — Very rough a.c. very harsh and broad.
3 — Rough a.c. tone, rectified but not filtered.
4 — Rough note, some trace of filtering.
5 — Filtered rectified a.c. but strongly ripple-modulated.
6 — Filtered tone, definite trace of ripple modulation.
7 — Near pure tone, trace of ripple modulation.
8 — Near perfect tone, slight trace of modulation.
9 — Perfect tone, no trace of ripple or modulation of any kind.

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Invitation to transmit (any station)	Go (ahead)	K	After CQ and at the end of a transmission during QSO when there is no objection to another station breaking in.
Invitation to transmit (specific station, *only*)	...only, Go	$\overline{KN}$	At the end of any transmission when only the specific station called or being contacted is invited to answer.
End of contact	Clear	$\overline{SK}$	At the end of a QSO. On cw, $\overline{SK}$ W8LMN DE W5BCD. On phone, W8LMN this is W5BCD clear.
Closing station	Clear and leaving the air	CL	When going off the air to indicate no calls will be listened for or answered. On phone, W7HIJ this is W2JKL, clear and leaving the air. On cw, W7HIJ DE W2JKL CL

CD-220 (6–79)

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0600	0200	0100	0000*	2300	2200
0700	0300	0200	0100	0000*	2300
0800	0400	0300	0200	0100	0000*
0900	0500	0400	0300	0200	0100
1000	0600	0500	0400	0300	0200
1100	0700	0600	0500	0400	0300
1200	0800	0700	0600	0500	0400
1300	0900	0800	0700	0600	0500
1400	1000	0900	0800	0700	0600
1500	1100	1000	0900	0800	0700
1600	1200	1100	1000	0900	0800
1700	1300	1200	1100	1000	0900
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Time zone letters may be used to identify the kind of time being used. For example, UTC is designated by the letter Z, EDT/AST by the letter Q, CDT/EST by R, MDT/CST by S, PDT/MST by T, PST by U; thus, 1200R would indicate noon in the CDT/EST zone, which would convert to 1700 UTC or 1700Z.

In converting from one time to another, be sure the day or date corresponds to the new time. That is, 2100R (EST) on Jan. 1 would be 0200Z (UTC) on Jan. 2; similarly, 0400Z on Jan. 2 would be 2000U (PST) on Jan. 1.

A good method is to use UTC (Z) for *all* amateur logging, schedule-making, QSLing and other amateur work. Confusion, with all the different time zones, is inevitable. Leave your clock on UTC.

The Canadian Maritime provinces and Puerto Rico use AST (Q) time, or ADST (P) time. Canal Zone uses EST (R) time. Most of Alaska and Hawaii use W time (+ 10 to UTC).

ARRL ENDING SIGNALS

Meaning	*Phone*	*C W*	*Use*
End of transmission	Over	$\overline{AR}$	After call to a specific station, before contact has been established. Examples: Phone — W6ABC from W9LMN, over. C W — W6ABC DE W9LMN $\overline{AR}$
End of formal message	End of message	$\overline{AR}$	After transmission of a radiogram, following the signature.
Invitation to transmit (any station)	Go (ahead)	K	After CQ and at the end of a transmission during QSO when there is no objection to another station breaking in.
Invitation to transmit (specific station, *only*)	... only, Go	$\overline{KN}$	At the end of any transmission when only the specific station called or being contacted is invited to answer.
End of contact	Clear	$\overline{SK}$	At the end of a QSO. On c w, $\overline{SK}$ W8LMN DE W5BCD. On phone, W8LMN this is W5BCD clear.
Closing station	Clear and leaving the air	CL	When going off the air to indicate no calls will be listened for or answered. On phone, W7HIJ this is W2JKL, clear and leaving the air. On c w, W7HIJ DE W2JKL CL

CD-220 (6–79)

The American Radio Relay League, Inc.
225 Main Street
Newington, Connecticut 06111

IN AN EMERGENCY

Monitor your local emergency net frequency.

Make contact with your local EC or RO.

Take immediate steps to follow any prearranged plans.

Stay off the air unless or until you are *sure* you can be of assistance.

In widespread emergencies, monitor W1AW for latest bulletins and news.

TIME CONVERSION CHART

UTC	EDT/AST	CDT/EST	MDT/CST	PDT/MST	PST
0000*	2000	1900	1800	1700	1600
0100	2100	2000	1900	1800	1700
0200	2200	2100	2000	1900	1800
0300	2300	2200	2100	2000	1900
0400	0000*	2300	2200	2100	2000
0500	0100	0000*	2300	2200	2100
0600	0200	0100	0000*	2300	2200
0700	0300	0200	0100	0000*	2300
0800	0400	0300	0200	0100	0000*
0900	0500	0400	0300	0200	0100
1000	0600	0500	0400	0300	0200
1100	0700	0600	0500	0400	0300
1200	0800	0700	0600	0500	0400
1300	0900	0800	0700	0600	0500
1400	1000	0900	0800	0700	0600
1500	1100	1000	0900	0800	0700
1600	1200	1100	1000	0900	0800
1700	1300	1200	1100	1000	0900
1800	1400	1300	1200	1100	1000
1900	1500	1400	1300	1200	1100
2000	1600	1500	1400	1300	1200
2100	1700	1600	1500	1400	1300
2200	1800	1700	1600	1500	1400
2300	1900	1800	1700	1600	1500
2400*	2000	1900	1800	1700	1600

Universal Coordinated Time (UTC) is the time at the zero or reference meridian. Time changes one hour with each change of 15° in longitude. The five time zones in the U.S. proper and Canada roughly follow these lines.

*0000 and 2400 are interchangeable. (2400 is associated with the date of the day ending, 0000 with the day just starting.

THE AMERICAN RADIO RELAY LEAGUE, INC.
Newington, Conn.

ITU Phonetic Alphabet

Word list adopted by the International Telecommunication Union

A	ALFA
B	BRAVO
C	CHARLIE
D	DELTA
E	ECHO
F	FOXTROT
G	GOLF
H	HOTEL
I	INDIA
J	JULIETT
K	KILO
L	LIMA
M	MIKE
N	NOVEMBER
O	OSCAR
P	PAPA
Q	QUEBEC
R	ROMEO
S	SIERRA
T	TANGO
U	UNIFORM
V	VICTOR
W	WHISKEY
X	X-RAY
Y	YANKEE
Z	ZULU

THE R-S-T SYSTEM

READABILITY

1 — Unreadable.
2 — Barely readable, occasional words distinguishable.
3 — Readable with considerable difficulty.
4 — Readable with practically no difficulty.
5 — Perfectly readable.

SIGNAL STRENGTH

1 — Faint signals, barely perceptible.
2 — Very weak signals.
3 — Weak signals.
4 — Fair signals.
5 — Fairly good signals.
6 — Good signals.
7 — Moderately strong signals.
8 — Strong signals.
9 — Extremely strong signals.

TONE

1 — Sixty cycle a.c. or less, very rough and broad.
2 — Very rough a.c. very harsh and broad.
3 — Rough a.c. tone, rectified but not filtered.
4 — Rough note, some trace of filtering.
5 — Filtered rectified a.c. but strongly ripple-modulated.
6 — Filtered tone, definite trace of ripple modulation.
7 — Near pure tone, trace of ripple modulation.
8 — Near perfect tone, slight trace of modulation.
9 — Perfect tone, no trace of ripple or modulation of any kind.

If the signal has the characteristic steadiness of crystal control, add the letter X to the RST report. If there is a chirp, the letter C may be added to so indicate. Similarly for a click, add K. The above reporting system is used on both c w and voice, leaving out the "tone" report on voice. Turn card over for examples.

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- *d.* Station of Origin (first amateur handler)
- *e.* Check (number of words/groups in text only)
- *f.* Place of Origin (not necessarily location of station of origin)
- *g.* Time Filed (optional with originating station)
- *h.* Date (must agree with date of time filed)

II ADDRESS (as complete as possible, include zip code and telephone number)

III TEXT (limit to 25 words or less, if possible)

IV SIGNATURE

CW MESSAGE EXAMPLE

I NR 1 R HXG W1AW 8 NEWINGTON CONN 1830Z July 1
a b c d e f g h

II DONALD R SMITH AA
164 EAST SIXTH AVE AA
NORTH RIVER CITY MO 00789 AA
733-3968 BT

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE BT

IV DIANA AR

CW: Note that X, when used in the text as punctuation, counts as a word. The prosign AA separates the parts of the address, BT separates the address from the text and the text from the signature. AR marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate line.

RTTY: Same as cw procedure above, except (1) use extra space between parts of address, instead of AA; (2) omit cw procedure sign BT to separate text from address and signature, using line spaces instead; (3) add a CFM line under the signature, consisting of all names, numerals and unusual words in the message in the order transmitted.

PHONE: In general, use *prowords* in place of procedural signals or *prosigns*. The above message on phone would go something like this: *"Message Follows* number one, routine HX Golf, W1AW, eight, Newington, Connecticut, one eight thuhree zero zulu, July one, Donald *Initial* R Smith, *Figures* one six fower, East Sixth Avenue, North River City, Missouri zero zero seven eight nine, *Telephone* sev-ven thuhree thuhree, thuhree niyen six eight. *Break* Happy Birthday X-ray see you soon X-ray love *Break* Diana, *End of Message, Over."* Speak in measured tones, emphasizing *every* syllable. Spell out phonetically all difficult or unusual words, but do *not* spell out common ones.

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HXC — Report date and time of delivery (TOD) to originating station.
HXD — Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.
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HXG — Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.

This prosign (when used) will be inserted in the message preamble before the station of origin, thus(NR 207 R HXA50 W1AW 12.....(etc.). If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated, thus: NR 207 R HXAC W1AW.....(etc.), but: NR 207 R HXA50 HXC W1AW....(etc.); On phone, use phonetics for the letter or letters following the HX, to insure accuracy.

CD 218 4/80 ARRL, 225 Main St., Newington, CT 06111

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III TEXT (limit to 25 words or less, if possible)

IV SIGNATURE

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I NR 1 R HXG W1AW 8 NEWINGTON CONN 1830Z July 1
a b c d e f g h

II DONALD R SMITH AA
164 EAST SIXTH AVE AA
NORTH RIVER CITY MO 00789 AA
733-3968 BT

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE BT

IV DIANA AR

CW: Note that X, when used in the text as punctuation, counts as a word. The prosign AA separates the parts of the address, BT separates the address from the text and the text from the signature. AR marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate line.

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a b c d e f g h

II DONALD R SMITH AA
164 EAST SIXTH AVE AA
NORTH RIVER CITY MO 00789 AA
733-3968 BT

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a b c d e f g h

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733-3968 $\overline{BT}$

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE $\overline{BT}$

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PRECEDENCES

The precedence will follow the message number. For example, on cw 207R or 207 EMERGENCY. On phone, "Two Zero Seven, Routine (or Emergency)."

EMERGENCY — Any message having life and death urgency to any person or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be *very rare.* On cw, this designation will *always* be spelled out. When in doubt, do *not* use it.

PRIORITY — Important messages having a specific time limit. Official messages not covered in the Emergency category. Press dispatches and other emergency-related traffic not of the utmost urgency. Notification of death or injury in a disaster area, personal or official. Use the abbreviation P on cw.

WELFARE — A message that is either a) an inquiry as to the health and welfare of an individual in the disaster area or b) an advisory or reply from the disaster area that indicates all is well should carry this precedence, which is abbreviated W on cw. These messages are handled *after* Emergency and Priority traffic but before Routine.

ROUTINE — Most traffic normal times will bear this designation. In disaster situations, traffic labeled Routine (R on cw) should be handled *last*, or not at all when circuits are busy with Emergency, Priority or Welfare traffic.

Handling Instructions

HXA — (Followed by number.) Collect landline delivery authorized by addressee within.....miles. (If no number, authorization is unlimited.)
HXB — (Followed by number.) Cancel message if not delivered within.....hours of filing time; service originating station.
HXC — Report date and time of delivery (TOD) to originating station.
HXD — Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.
HXE — Delivering station get reply from addressee, originate message back.
HXF — (Followed by number.) Hold delivery until.....(date).
HXG — Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.

This prosign (when used) will be inserted in the message preamble before the station of origin, thus(NR 207 R HXA50 W1AW 12.....(etc.). If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated, thus: NR 207 R HXAC W1AW.....(etc.), but: NR 207 R HXA50 HXC W1AW.....(etc.); On phone, use phonetics for the letter or letters following the HX, to insure accuracy.

CD 218 4/80 ARRL, 225 Main St., Newington, CT 06111

AMATEUR MESSAGE FORM

Every message originated and handled should contain the following component parts in the order given.

I PREAMBLE
- *a.* Number (begin with 1 each month or year)
- *b.* Precedence (R, W, P or EMERGENCY)
- *c.* Handling Instructions (optional, see text)
- *d.* Station of Origin (first amateur handler)
- *e.* Check (number of words/groups in text only)
- *f.* Place of Origin (not necessarily location of station of origin)
- *g.* Time Filed (optional with originating station)
- *h.* Date (must agree with date of time filed)

II ADDRESS (as complete as possible, include zip code and telephone number)

III TEXT (limit to 25 words or less, if possible)

IV SIGNATURE

CW MESSAGE EXAMPLE

I NR 1 R HXG W1AW 8 NEWINGTON CONN 1830Z July 1
a b c d e f g h

II DONALD R SMITH AA
164 EAST SIXTH AVE AA
NORTH RIVER CITY MO 00789 AA
733-3968 BT

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE BT

IV DIANA AR

CW: Note that X, when used in the text as punctuation, counts as a word. The prosign AA separates the parts of the address, BT separates the address from the text and the text from the signature. AR marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate line.

RTTY: Same as cw procedure above, except (1) use extra space between parts of address, instead of AA; (2) omit cw procedure sign BT to separate text from address and signature, using line spaces instead; (3) add a CFM line under the signature, consisting of all names, numerals and unusual words in the message in the order transmitted.

PHONE: In general, use *prowords* in place of procedural signals or *prosigns*. The above message on phone would go something like this: *"Message Follows* number one, routine HX Golf, W1AW, eight, Newington, Connecticut, one eight thuhree zero zulu, July one, Donald *Initial* R Smith, *Figures* one six fower, East Sixth Avenue, North River City, Missouri zero zero seven eight nine, *Telephone* sev-ven thuhree thuhree, thuhree niyen six eight. *Break* Happy Birthday X-ray see you soon X-ray love *Break* Diana, *End of Message, Over."* Speak in measured tones, emphasizing *every* syllable. Spell out phonetically all difficult or unusual words, but do *not* spell out common ones.

PRECEDENCES

The precedence will follow the message number. For example, on cw 207R or 207 EMERGENCY. On phone, "Two Zero Seven, Routine (or Emergency).

EMERGENCY — Any message having life and death urgency to any person or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be *very rare.* On cw, this designation will *always* be spelled out. When in doubt, do *not* use it.

PRIORITY — Important messages having a specific time limit. Official messages not covered in the Emergency category. Press dispatches and other emergency-related traffic not of the utmost urgency. Notification of death or injury in a disaster area, personal or official. Use the abbreviation P on cw.

WELFARE — A message that is either a) an inquiry as to the health and welfare of an individual in the disaster area or b) an advisory or reply from the disaster area that indicates all is well should carry this precedence, which is abbreviated W on cw. These messages are handled *after* Emergency and Priority traffic but before Routine.

ROUTINE — Most traffic normal times will bear this designation. In disaster situations, traffic labeled Routine (R on cw) should be handled *last*, or not at all when circuits are busy with Emergency, Priority or Welfare traffic.

Handling Instructions

HXA — (Followed by number.) Collect landline delivery authorized by addressee within . . . . . miles. (If no number, authorization is unlimited.)
HXB — (Followed by number.) Cancel message if not delivered within . . . . hours of filing time; service originating station.
HXC — Report date and time of delivery (TOD) to originating station.
HXD — Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.
HXE — Delivering station get reply from addressee, originate message back.
HXF — (Followed by number.) Hold delivery until . . . . . (date).
HXG — Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.

This prosign (when used) will be inserted in the message preamble before the station of origin, thus(NR 207 R HXA50 W1AW 12 . . . . . (etc.). If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated, thus: NR 207 R HXAC W1AW . . . . . (etc.), but: NR 207 R HXA50 HXC W1AW . . . . (etc.); On phone, use phonetics for the letter or letters following the HX, to insure accuracy.

CD 218 4/80 ARRL, 225 Main St., Newington, CT 06111

AMATEUR MESSAGE FORM

Every message originated and handled should contain the following component parts in the order given.

I PREAMBLE
- *a.* Number (begin with 1 each month or year)
- *b.* Precedence (R, W, P or EMERGENCY)
- *c.* Handling Instructions (optional, see text)
- *d.* Station of Origin (first amateur handler)
- *e.* Check (number of words/groups in text only)
- *f.* Place of Origin (not necessarily location of station of origin)
- *g.* Time Filed (optional with originating station)
- *h.* Date (must agree with date of time filed)

II ADDRESS (as complete as possible, include zip code and telephone number)

III TEXT (limit to 25 words or less, if possible)

IV SIGNATURE

CW MESSAGE EXAMPLE

I NR 1 R HXG W1AW 8 NEWINGTON CONN 1830Z July 1
a b c d e f g h

II DONALD R SMITH AA
164 EAST SIXTH AVE AA
NORTH RIVER CITY MO 00789 AA
733-3968 BT

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE BT

IV DIANA AR

CW: Note that X, when used in the text as punctuation, counts as a word. The prosign AA separates the parts of the address, BT separates the address from the text and the text from the signature. AR marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate line.

RTTY: Same as cw procedure above, except (1) use extra space between parts of address, instead of AA; (2) omit cw procedure sign BT to separate text from address and signature, using line spaces instead; (3) add a CFM line under the signature, consisting of all names, numerals and unusual words in the message in the order transmitted.

PHONE: In general, use *prowords* in place of procedural signals or *prosigns*. The above message on phone would go something like this: *"Message Follows* number one, routine HX Golf, W1AW, eight, Newington, Connecticut, one eight thuhree zero zulu, July one, Donald *initial* R Smith, *Figures* one six fower, East Sixth Avenue, North River City, Missouri zero zero seven eight nine, *Telephone* sev-ven thuhree thuhree, thuhree niyen six eight. *Break* Happy Birthday X-ray see you soon X-ray love *Break* Diana, *End of Message, Over."* Speak in measured tones, emphasizing *every* syllable. Spell out phonetically all difficult or unusual words, but do *not* spell out common ones.

PRECEDENCES

The precedence will follow the message number. For example, on cw 207R or 207 EMERGENCY. On phone, "Two Zero Seven, Routine (or Emergency)."

EMERGENCY — Any message having life and death urgency to any person or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be *very rare.* On cw, this designation will *always* be spelled out. When in doubt, do *not* use it.

PRIORITY — Important messages having a specific time limit. Official messages not covered in the Emergency category. Press dispatches and other emergency-related traffic not of the utmost urgency. Notification of death or injury in a disaster area, personal or official. Use the abbreviation P on cw.

WELFARE — A message that is either a) an inquiry as to the health and welfare of an individual in the disaster area or b) an advisory or reply from the disaster area that indicates all is well should carry this precedence, which is abbreviated W on cw. These messages are handled *after* Emergency and Priority traffic but before Routine.

ROUTINE — Most traffic normal times will bear this designation. In disaster situations, traffic labeled Routine (R on cw) should be handled *last*, or not at all when circuits are busy with Emergency, Priority or Welfare traffic.

Handling Instructions

HXA — (Followed by number.) Collect landline delivery authorized by addressee within . . . . miles. (If no number, authorization is unlimited.)
HXB — (Followed by number.) Cancel message if not delivered within . . . . hours of filing time; service originating station.
HXC — Report date and time of delivery (TOD) to originating station.
HXD — Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.
HXE — Delivering station get reply from addressee, originate message back.
HXF — (Followed by number.) Hold delivery until . . . . (date).
HXG — Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.

This prosign (when used) will be inserted in the message preamble before the station of origin, thus(NR 207 R HXA50 W1AW 12 . . . . (etc.). If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated, thus: NR 207 R HXAC W1AW . . . . (etc.), but: NR 207 R HXA50 HXC W1AW . . . . (etc.); On phone, use phonetics for the letter or letters following the HX, to insure accuracy.

CD 218 4/80

ARRL, 225 Main St., Newington, CT 06111

AMATEUR MESSAGE FORM

Every message originated and handled should contain the following component parts in the order given.

I **PREAMBLE**
- *a.* Number (begin with 1 each month or year)
- *b.* Precedence (R, W, P or EMERGENCY)
- *c.* Handling Instructions (optional, see text)
- *d.* Station of Origin (first amateur handler)
- *e.* Check (number of words/groups in text only)
- *f.* Place of Origin (not necessarily location of station of origin)
- *g.* Time Filed (optional with originating station)
- *h.* Date (must agree with date of time filed)

II **ADDRESS** (as complete as possible, include zip code and telephone number)

III **TEXT** (limit to 25 words or less, if possible)

IV **SIGNATURE**

CW MESSAGE EXAMPLE

I NR 1 R HXG W1AW 8 NEWINGTON CONN 1830Z July 1
a b c d e f g h

II DONALD R SMITH AA
164 EAST SIXTH AVE AA
NORTH RIVER CITY MO 00789 AA
733-3968 BT

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE BT

IV DIANA AR

CW: Note that X, when used in the text as punctuation, counts as a word. The prosign AA separates the parts of the address, BT separates the address from the text and the text from the signature. AR marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate line.

RTTY: Same as cw procedure above, except (1) use extra space between parts of address, instead of AA; (2) omit cw procedure sign BT to separate text from address and signature, using line spaces instead; (3) add a CFM line under the signature, consisting of all names, numerals and unusual words in the message in the order transmitted.

PHONE: In general, use *prowords* in place of procedural signals or *prosigns*. The above message on phone would go something like this: *"Message Follows* number one, routine HX Golf, W1AW, eight, Newington, Connecticut, one eight thuhree zero zulu, July one, Donald *Initial* R Smith, *Figures* one six fower, East Sixth Avenue, North River City, Missouri zero zero seven eight nine, *Telephone* sev-ven thuhree thuhree, thuhree niyen six eight. *Break* Happy Birthday X-ray see you soon X-ray love *Break* Diana, *End of Message, Over."* Speak in measured tones, emphasizing *every* syllable. Spell out phonetically all difficult or unusual words, but do *not* spell out common ones.

PRECEDENCES

The precedence will follow the message number. For example, on cw 207R or 207 EMERGENCY. On phone, "Two Zero Seven, Routine (or Emergency)."

EMERGENCY — Any message having life and death urgency to any person or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be *very rare.* On cw, this designation will *always* be spelled out. When in doubt, do *not* use it.

PRIORITY — Important messages having a specific time limit. Official messages not covered in the Emergency category. Press dispatches and other emergency-related traffic not of the utmost urgency. Notification of death or injury in a disaster area, personal or official. Use the abbreviation P on cw.

WELFARE — A message that is either a) an inquiry as to the health and welfare of an individual in the disaster area or b) an advisory or reply from the disaster area that indicates all is well should carry this precedence, which is abbreviated W on cw. These messages are handled *after* Emergency and Priority traffic but before Routine.

ROUTINE — Most traffic normal times will bear this designation. In disaster situations, traffic labeled Routine (R on cw) should be handled *last*, or not at all when circuits are busy with Emergency, Priority or Welfare traffic.

Handling Instructions

HXA — (Followed by number.) Collect landline delivery authorized by addressee within . . . . miles. (If no number, authorization is unlimited.)
HXB — (Followed by number.) Cancel message if not delivered within . . . . hours of filing time; service originating station.
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HXF — (Followed by number.) Hold delivery until . . . . . (date).
HXG — Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.

This prosign (when used) will be inserted in the message preamble before the station of origin, thus(NR 207 R HXA50 W1AW 12 . . . . . (etc.). If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated, thus: NR 207 R HXAC W1AW . . . . (etc.), but: NR 207 R HXA50 HXC W1AW . . . . (etc.); On phone, use phonetics for the letter or letters following the HX, to insure accuracy.

CD 218 4/80

ARRL, 225 Main St., Newington, CT 06111

AMATEUR MESSAGE FORM

Every message originated and handled should contain the following component parts in the order given.

I PREAMBLE
- *a.* Number (begin with 1 each month or year)
- *b.* Precedence (R, W, P or EMERGENCY)
- *c.* Handling Instructions (optional, see text)
- *d.* Station of Origin (first amateur handler)
- *e.* Check (number of words/groups in text only)
- *f.* Place of Origin (not necessarily location of station of origin)
- *g.* Time Filed (optional with originating station)
- *h.* Date (must agree with date of time filed)

II ADDRESS (as complete as possible, include zip code and telephone number)

III TEXT (limit to 25 words or less, if possible)

IV SIGNATURE

CW MESSAGE EXAMPLE

I NR 1 R HXG W1AW 8 NEWINGTON CONN 1830Z July 1
a b c d e f g h

II DONALD R SMITH AA
164 EAST SIXTH AVE AA
NORTH RIVER CITY MO 00789 AA
733-3968 BT

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE BT

IV DIANA AR

CW: Note that X, when used in the text as punctuation, counts as a word. The prosign AA separates the parts of the address, BT separates the address from the text and the text from the signature. AR marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate line.

RTTY: Same as cw procedure above, except (1) use extra space between parts of address, instead of AA; (2) omit cw procedure sign BT to separate text from address and signature, using line spaces instead; (3) add a CFM line under the signature, consisting of all names, numerals and unusual words in the message in the order transmitted.

PHONE: In general, use *prowords* in place of procedural signals or *prosigns*. The above message on phone would go something like this: *"Message Follows* number one, routine HX Golf, W1AW, eight, Newington, Connecticut, one eight thuhree zero zulu, July one, Donald *Initial* R Smith, *Figures* one six fower, East Sixth Avenue, North River City, Missouri zero zero seven eight nine, *Telephone* sev-ven thuhree thuhree, thuhree niyen six eight. *Break* Happy Birthday X-ray see you soon X-ray love *Break* Diana, *End of Message, Over."* Speak in measured tones, emphasizing *every* syllable. Spell out phonetically all difficult or unusual words, but do *not* spell out common ones.

PRECEDENCES

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WELFARE — A message that is either a) an inquiry as to the health and welfare of an individual in the disaster area or b) an advisory or reply from the disaster area that indicates all is well should carry this precedence, which is abbreviated W on cw. These messages are handled *after* Emergency and Priority traffic but before Routine.

ROUTINE — Most traffic normal times will bear this designation. In disaster situations, traffic labeled Routine (R on cw) should be handled *last*, or not at all when circuits are busy with Emergency, Priority or Welfare traffic.

Handling Instructions

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This prosign (when used) will be inserted in the message preamble before the station of origin, thus(NR 207 R HXA50 W1AW 12.....(etc.). If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated, thus: NR 207 R HXAC W1AW.....(etc.), but: NR 207 R HXA50 HXC W1AW...(etc.); On phone, use phonetics for the letter or letters following the HX, to insure accuracy.

CD 218 4/80 ARRL, 225 Main St., Newington, CT 06111

AMATEUR MESSAGE FORM

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I PREAMBLE
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- *g.* Time Filed (optional with originating station)
- *h.* Date (must agree with date of time filed)

II ADDRESS (as complete as possible, include zip code and telephone number)

III TEXT (limit to 25 words or less, if possible)

IV SIGNATURE

CW MESSAGE EXAMPLE

I NR 1 R HXG W1AW 8 NEWINGTON CONN 1830Z July 1
a b c d e f g h

II DONALD R SMITH AA
164 EAST SIXTH AVE AA
NORTH RIVER CITY MO 00789 AA
733-3968 BT

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE BT

IV DIANA AR

CW: Note that X, when used in the text as punctuation, counts as a word. The prosign AA separates the parts of the address, BT separates the address from the text and the text from the signature. AR marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate line.

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This prosign (when used) will be inserted in the message preamble before the station of origin, thus(NR 207 R HXA50 W1AW 12.....(etc.). If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated, thus: NR 207 R HXAC W1AW.....(etc.), but: NR 207 R HXA50 HXC W1AW.....(etc.); On phone, use phonetics for the letter or letters following the HX, to insure accuracy.

CD 218 4/80 ARRL, 225 Main St., Newington, CT 06111

AMATEUR MESSAGE FORM

Every message originated and handled should contain the following component parts in the order given.

I PREAMBLE
- *a.* Number (begin with 1 each month or year)
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- *d.* Station of Origin (first amateur handler)
- *e.* Check (number of words/groups in text only)
- *f.* Place of Origin (not necessarily location of station of origin)
- *g.* Time Filed (optional with originating station)
- *h.* Date (must agree with date of time filed)

II ADDRESS (as complete as possible, include zip code and telephone number)

III TEXT (limit to 25 words or less, if possible)

IV SIGNATURE

CW MESSAGE EXAMPLE

I NR 1 R HXG W1AW 8 NEWINGTON CONN 1830Z July 1
a b c d e f g h

II DONALD R SMITH AA
164 EAST SIXTH AVE AA
NORTH RIVER CITY MO 00789 AA
733-3968 BT

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE BT

IV DIANA AR

CW: Note that X, when used in the text as punctuation, counts as a word. The prosign AA separates the parts of the address, BT separates the address from the text and the text from the signature. AR marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate line.

RTTY: Same as cw procedure above, except (1) use extra space between parts of address, instead of AA; (2) omit cw procedure sign BT to separate text from address and signature, using line spaces instead; (3) add a CFM line under the signature, consisting of all names, numerals and unusual words in the message in the order transmitted.

PHONE: In general, use *prowords* in place of procedural signals or *prosigns*. The above message on phone would go something like this: *"Message Follows* number one, routine HX Golf, W1AW, eight, Newington, Connecticut, one eight thuhree zero zulu, July one, Donald *Initial* R Smith, *Figures* one six fower, East Sixth Avenue, North River City, Missouri zero zero seven eight nine, *Telephone* sev-ven thuhree thuhree, thuhree niyen six eight. *Break* Happy Birthday X-ray see you soon X-ray love *Break* Diana, *End of Message, Over."* Speak in measured tones, emphasizing *every* syllable. Spell out phonetically all difficult or unusual words, but do *not* spell out common ones.

PRECEDENCES

The precedence will follow the message number. For example, on cw 207R or 207 EMERGENCY. On phone, "Two Zero Seven, Routine (or Emergency)."

EMERGENCY — Any message having life and death urgency to any person or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be *very rare*. On cw, this designation will *always* be spelled out. When in doubt, do *not* use it.

PRIORITY — Important messages having a specific time limit. Official messages not covered in the Emergency category. Press dispatches and other emergency-related traffic not of the utmost urgency. Notification of death or injury in a disaster area, personal or official. Use the abbreviation P on cw.

WELFARE — A message that is either a) an inquiry as to the health and welfare of an individual in the disaster area or b) an advisory or reply from the disaster area that indicates all is well should carry this precedence, which is abbreviated W on cw. These messages are handled *after* Emergency and Priority traffic but before Routine.

ROUTINE — Most traffic normal times will bear this designation. In disaster situations, traffic labeled Routine (R on cw) should be handled *last*, or not at all when circuits are busy with Emergency, Priority or Welfare traffic.

Handling Instructions

HXA — (Followed by number.) Collect landline delivery authorized by addressee within.....miles. (If no number, authorization is unlimited.)
HXB — (Followed by number.) Cancel message if not delivered within.....hours of filing time; service originating station.
HXC — Report date and time of delivery (TOD) to originating station.
HXD — Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.
HXE — Delivering station get reply from addressee, originate message back.
HXF — (Followed by number.) Hold delivery until.....(date).
HXG — Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.

This prosign (when used) will be inserted in the message preamble before the station of origin, thus(NR 207 R HXA50 W1AW 12.....(etc.). If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated, thus: NR 207 R HXAC W1AW.....(etc.), but: NR 207 R HXA50 HXC W1AW.....(etc.); On phone, use phonetics for the letter or letters following the HX, to insure accuracy.

CD 218 4/80

ARRL, 225 Main St., Newington, CT 06111

AMATEUR MESSAGE FORM

Every message originated and handled should contain the following component parts in the order given.

I PREAMBLE
- *a.* Number (begin with 1 each month or year)
- *b.* Precedence (R, W, P or EMERGENCY)
- *c.* Handling Instructions (optional, see text)
- *d.* Station of Origin (first amateur handler)
- *e.* Check (number of words/groups in text only)
- *f.* Place of Origin (not necessarily location of station of origin)
- *g.* Time Filed (optional with originating station)
- *h.* Date (must agree with date of time filed)

II ADDRESS (as complete as possible, include zip code and telephone number)

III TEXT (limit to 25 words or less, if possible)

IV SIGNATURE

CW MESSAGE EXAMPLE

I NR 1 R HXG W1AW 8 NEWINGTON CONN 1830Z July 1
a b c d e f g h

II DONALD R SMITH AA
164 EAST SIXTH AVE AA
NORTH RIVER CITY MO 00789 AA
733-3968 BT

III HAPPY BIRTHDAY X SEE YOU SOON X LOVE BT

IV DIANA AR

CW: Note that X, when used in the text as punctuation, counts as a word. The prosign AA separates the parts of the address, BT separates the address from the text and the text from the signature. AR marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate line.

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CD 218 4/80 ARRL, 225 Main St., Newington, CT 06111

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Group One -- -- For Possible "Relief Emergency" Use

ONE	Everyone safe here. Please don't worry.
TWO	Coming home as soon as possible.
THREE	Am in _____ hospital. Receiving excellent care and recovering fine.
FOUR	Only slight property damage here. Do not be concerned about disaster reports.
FIVE	Am moving to new location. Send no further mail or communication. Will inform you of new address when relocated.
SIX	Will contact you as soon as possible.
SEVEN	Please reply by Amateur Radio through the amateur delivering this message. This is a free public service.
EIGHT	Need additional _____ mobile or portable equipment for immediate emergency use.
NINE	Additional _____ radio operators needed to assist with emergency at this location.
TEN	Please contact _____ . Advise to standby and provide further emergency information, instructions or assistance.
ELEVEN	Establish Amateur Radio emergency communications with _____ on _____ MHz.
TWELVE	Anxious to hear from you. No word in some time. Please contact me as soon as possible.
THIRTEEN	Medical emergency situation exists here.
FOURTEEN	Situation here becoming critical. Losses and damage from _____ increasing.
FIFTEEN	Please advise your condition and what help is needed.
SIXTEEN	Property damage very severe in this area.
SEVENTEEN	REACT communications services also available. Establish REACT communications with _____ on channel _____ .
EIGHTEEN	Please contact me as soon as possible at _____ .
NINETEEN	Request health and welfare report on _____ . (State name, address and telephone number.)
TWENTY	Temporarily stranded. Will need some assistance. Please contact me at _____ .
TWENTY ONE	Search and Rescue assistance is needed by local authorities here. Advise availability.
TWENTY TWO	Need accurate information on the extent and type of conditions now existing at your location. Please furnish this information and reply without delay.
TWENTY THREE	Report at once the accessibility and best way to reach your location.
TWENTY FOUR	Evacuation of residents from this area urgently needed. Advise plans for help.
TWENTY FIVE	Furnish as soon as possible the weather conditions at your location.
TWENTY SIX	Help and care for evacuation of sick and injured from this location needed at once.

Emergency/priority messages originating from official sources, must carry the signature of the originating official.

Group Two -- -- Routine messages

FORTY SIX	Greetings on your birthday and best wishes for many more to come.
FIFTY	Greetings by Amateur Radio.
FIFTY ONE	Greetings by Amateur Radio. This message is sent as a free public service by ham radio operators here at _____ . Am having a wonderful time.
FIFTY TWO	Really enjoyed being with you. Looking forward to getting together again.
FIFTY THREE	Received your _____ . It's appreciated; many thanks.
FIFTY FOUR	Many thanks for your good wishes.
FIFTY FIVE	Good news is always welcome. Very delighted to hear about yours.
FIFTY SIX	Congratulations on your _____ , a most worthy and deserved achievement.
FIFTY SEVEN	Wish we could be together.
FIFTY EIGHT	Have a wonderful time. Let us know when you return.
FIFTY NINE	Congratulations on the new arrival. Hope mother and child are well.
*SIXTY	Wishing you the best of everything on _____ .
SIXTY ONE	Wishing you a very merry Christmas and a happy New Year.
*SIXTY TWO	Greetings and best wishes to you for a pleasant _____ holiday season.
SIXTY THREE	Victory or defeat, our best wishes are with you. Hope you win.
SIXTY FOUR	Arrived safely at _____ .
SIXTY FIVE	Arriving _____ on _____ . Please arrange to meet me there.
SIXTY SIX	DX QSLs are on hand for you at the _____ QSL Bureau. Send _____ self addressed envelopes.
SIXTY SEVEN	Your message number _____ undeliverable because of _____ . Please advise.
SIXTY EIGHT	Sorry to hear you are ill. Best wishes for a speedy recovery.

*Can be used for all holidays.

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ARRL RECOMMENDED PRECEDENCES

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Precedences

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American Radio Relay League, 225 Main Street, Newington, CT 06111

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Group One -- -- For Possible "Relief Emergency" Use

ONE	Everyone safe here. Please don't worry.
TWO	Coming home as soon as possible.
THREE	Am in _____ hospital. Receiving excellent care and recovering fine.
FOUR	Only slight property damage here. Do not be concerned about disaster reports.
FIVE	Am moving to new location. Send no further mail or communication. Will inform you of new address when relocated.
SIX	Will contact you as soon as possible.
SEVEN	Please reply by Amateur Radio through the amateur delivering this message. This is a free public service.
EIGHT	Need additional _____ mobile or portable equipment for immediate emergency use.
NINE	Additional _____ radio operators needed to assist with emergency at this location.
TEN	Please contact _____ . Advise to standby and provide further emergency information, instructions or assistance.
ELEVEN	Establish Amateur Radio emergency communications with _____ on _____ MHz.
TWELVE	Anxious to hear from you. No word in some time. Please contact me as soon as possible.
THIRTEEN	Medical emergency situation exists here.
FOURTEEN	Situation here becoming critical. Losses and damage from _____ increasing.
FIFTEEN	Please advise your condition and what help is needed.
SIXTEEN	Property damage very severe in this area.
SEVENTEEN	REACT communications services also available. Establish REACT communications with _____ on channel _____ .
EIGHTEEN	Please contact me as soon as possible at _____ .
NINETEEN	Request health and welfare report on _____ . (State name, address and telephone number.)
TWENTY	Temporarily stranded. Will need some assistance. Please contact me at _____ .
TWENTY ONE	Search and Rescue assistance is needed by local authorities here. Advise availability.
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Group Two -- -- Routine messages

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SIXTY THREE	Victory or defeat, our best wishes are with you. Hope you win.
SIXTY FOUR	Arrived safely at _____ .
SIXTY FIVE	Arriving _____ on _____ . Please arrange to meet me there.
SIXTY SIX	DX QSLs are on hand for you at the _____ QSL Bureau. Send _____ self addressed envelopes.
SIXTY SEVEN	Your message number _____ undeliverable because of _____ . Please advise.
SIXTY EIGHT	Sorry to hear you are ill. Best wishes for a speedy recovery.

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FIVE	Am moving to new location. Send no further mail or communication. Will inform you of new address when relocated.
SIX	Will contact you as soon as possible.
SEVEN	Please reply by Amateur Radio through the amateur delivering this message. This is a free public service.
EIGHT	Need additional _____ mobile or portable equipment for immediate emergency use.
NINE	Additional _____ radio operators needed to assist with emergency at this location.
TEN	Please contact _____ . Advise to standby and provide further emergency information, instructions or assistance.
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NINE	Additional _____ radio operators needed to assist with emergency at this location.
TEN	Please contact _____ . Advise to standby and provide further emergency information, instructions or assistance.
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FIFTY EIGHT	Have a wonderful time. Let us know when you return.
FIFTY NINE	Congratulations on the new arrival. Hope mother and child are well.
*SIXTY	Wishing you the best of everything on _____ .
SIXTY ONE	Wishing you a very merry Christmas and a happy New Year.
*SIXTY TWO	Greetings and best wishes to you for a pleasant _____ holiday season.
SIXTY THREE	Victory or defeat, our best wishes are with you. Hope you win.
SIXTY FOUR	Arrived safely at _____ .
SIXTY FIVE	Arriving _____ on _____ . Please arrange to meet me there.
SIXTY SIX	DX QSLs are on hand for you at the _____ QSL Bureau. Send _____ self addressed envelopes.
SIXTY SEVEN	Your message number _____ undeliverable because of _____ . Please advise.
SIXTY EIGHT	Sorry to hear you are ill. Best wishes for a speedy recovery.

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Group One -- -- For Possible "Relief Emergency" Use

ONE	Everyone safe here. Please don't worry.
TWO	Coming home as soon as possible.
THREE	Am in _____ hospital. Receiving excellent care and recovering fine.
FOUR	Only slight property damage here. Do not be concerned about disaster reports.
FIVE	Am moving to new location. Send no further mail or communication. Will inform you of new address when relocated.
SIX	Will contact you as soon as possible.
SEVEN	Please reply by Amateur Radio through the amateur delivering this message. This is a free public service.
EIGHT	Need additional _____ mobile or portable equipment for immediate emergency use.
NINE	Additional _____ radio operators needed to assist with emergency at this location.
TEN	Please contact _____ . Advise to standby and provide further emergency information, instructions or assistance.
ELEVEN	Establish Amateur Radio emergency communications with _____ on _____ MHz.
TWELVE	Anxious to hear from you. No word in some time. Please contact me as soon as possible.
THIRTEEN	Medical emergency situation exists here.
FOURTEEN	Situation here becoming critical. Losses and damage from _____ increasing.
FIFTEEN	Please advise your condition and what help is needed.
SIXTEEN	Property damage very severe in this area.
SEVENTEEN	REACT communications services also available. Establish REACT communications with _____ on channel _____ .
EIGHTEEN	Please contact me as soon as possible at _____ .
NINETEEN	Request health and welfare report on _____ . (State name, address and telephone number.)
TWENTY	Temporarily stranded. Will need some assistance. Please contact me at _____ .
TWENTY ONE	Search and Rescue assistance is needed by local authorities here. Advise availability.
TWENTY TWO	Need accurate information on the extent and type of conditions now existing at your location. Please furnish this information and reply without delay.
TWENTY THREE	Report at once the accessibility and best way to reach your location.
TWENTY FOUR	Evacuation of residents from this area urgently needed. Advise plans for help.
TWENTY FIVE	Furnish as soon as possible the weather conditions at your location.
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Group Two -- -- Routine messages

FORTY SIX	Greetings on your birthday and best wishes for many more to come.
FIFTY	Greetings by Amateur Radio.
FIFTY ONE	Greetings by Amateur Radio. This message is sent as a free public service by ham radio operators here at _____ . Am having a wonderful time.
FIFTY TWO	Really enjoyed being with you. Looking forward to getting together again.
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Group One -- -- For Possible "Relief Emergency" Use

ONE	Everyone safe here. Please don't worry.
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FORTY SIX	Greetings on your birthday and best wishes for many more to come.
FIFTY	Greetings by Amateur Radio.
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ONE	Everyone safe here. Please don't worry.
TWO	Coming home as soon as possible.
THREE	Am in _____ hospital. Receiving excellent care and recovering fine.
FOUR	Only slight property damage here. Do not be concerned about disaster reports.
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SIX	Will contact you as soon as possible.
SEVEN	Please reply by Amateur Radio through the amateur delivering this message. This is a free public service.
EIGHT	Need additional _____ mobile or portable equipment for immediate emergency use.
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Your Outgoing QSL Bureau

An outstanding benefit of League membership is the right to use the ARRL Outgoing QSL Bureau. The potential savings to you is equal to many times the price of your annual dues.

By R. L. White,* W1CW/4

Since the ARRL Outgoing QSL Service was founded November 1, 1976, thousands of League members have taken advantage of this service to send their DX QSLs overseas. We're surprised that even more people don't use the Bureau, as it is a membership benefit par excellence. Bob White, W1CW/4, former assistant communications manager for DXCC and the original manager of the League's Outgoing QSL Bureau, wrote the following article to announce the opening of the Outgoing Bureau. It has been updated where appropriate by Hal Steinman, K1FHN, manager of the Membership Services Department.

TNX QSO OM — PSE QSL VIA BURO . . .

"I've done it! I've finally worked some real DX! And will I QSL? You better believe it, especially for a country all the way across the ocean. But 'via Buro'? We've landed men on the moon and a vehicle on Mars and this guy thinks we're still using animals to carry the mail?

"Anyway, I'll send him a card direct with an envelope made out to me with a stamp on the envelope, just as I do when I work a new state. If I tell him he's my very first QSO with his country, that should get to him and he's sure to QSL. Let me see now, I'll need to borrow a foreign *Callbook*; my U.S. one won't help much. And I guess my putting a U.S. stamp on the s.a.s.e. won't do him any good either. Maybe I could send him a dollar bill, but I heard that some foreign countries come down hard when they find someone with foreign money. Sure don't want to get him in trouble; he might not QSL. Got it! I'll send him some International Reply Coupons. According to the fine print on them, each one can be exchanged for the postage required to mail a first-class letter to almost any country in the world.

"The *Callbook* has a listing of the number of IRCs needed to equal what an airmail reply for my card will cost him. But wait just a doggone minute. I heard a fellow on the air just the other day saying that he'd gone to the post office to get some IRCs and they now cost 65¢ each! Let me see now, two IRCs, two envelopes, my airmail postage to send him my card and the IRCs and envelope . . . that's almost $2 for a single QSL! I'll go broke before I get halfway to making my DXCC. There just has to be a cheaper way. . . ."

Don't go broke. There is indeed a cheaper way, and the DX station said it: via the QSL bureau.

To some amateurs QSL cards are a hobby in themselves. The colors, the pictures, the handwriting and the names of countries stir the mind to visions of faraway places and recollections of past contacts. Some people can blow their minds and trip out just going through a batch of QSLs. Then there are those to whom a QSL is a means to an end, the achievement of a goal or an award.

Some amateurs "brag" about never having sent out any QSLs but who claim to have received enough QSLs to make DXCC. The percentages don't favor that

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QSL Bureau Manager Joan Becker sorts cards at ARRL Hq. She and her assistants, Gail Paul and Denise Piscottano, ensure that members' cards are sent overseas promptly.

The large number of packages awaiting shipment to QSL bureaus around the world attests to the volume of cards that pass through Hq. Packages are mailed once each week.

Requirements for Using the ARRL Outgoing Bureau

(1) Presort your DX QSLs alphabetically by call-sign prefix (A3, AP, C6, CE, F, FG, G, GI, GM, JA, 3A2 and so on).

(2) Enclose the address label from the brown wrapper of your current copy of *QST*. This information shows that you are a current ARRL member.

Family members may also use the service by enclosing their QSLs with those of the primary member. Include the appropriate fee with each individual's cards and indicate "family membership."

Blind members who do not receive *QST* should indicate that the QSLs are from a "blind member."

ARRL affiliated club stations may use the service when submitting club QSLs by indicating the club name. Club secretaries should check affiliation papers to ensure that membership is current.

In addition to sending club station QSLs through the Bureau, affiliated clubs may also "pool" their members' individual QSL cards to effect an even greater savings. Each club member using this service must also be a League member. For example, if 25 members of your club wish to send cards to the Outgoing QSL Bureau during a particular month, and each has less than a pound of cards, the fee would be $1 each, or $25, if each member sent his or her cards individually. Each member would have to pay postage, also. Alternatively, these club members who are also League members can send their cards through the club, and the club would pay a fee (which would no doubt be considerably less than $25) based on the total weight of the cards. The club would then charge each member on a pro rata basis, or reimburse itself from club dues, or whatever it chooses. Cards should be sorted "en masse" by prefix, and *QST* labels enclosed for each ARRL member sending cards. ARRL Hq. is able to offer this discount as a benefit to affiliated clubs because it reduces the amount of time spent opening mail and sorting QSL cards by the QSL bureau.

3) Enclose payment of $1 per pound of cards or portion thereof (there are approximately 155 cards in a pound) in the form of a check or money order. Cash is not recommended. Please write your call on check.

happening. For an amateur in the U.S. or Canada who wants to *get* QSLs (for whatever reason), that amateur should be prepared to *send* QSLs.

But, the filling out of QSLs, finding addresses, addressing envelopes, stuffing envelopes and mailing become unpleasant chores that take time that could be spent operating. Thus, to support the objective of keeping amateurs on the air, the ARRL-Membership Outgoing QSL Service was established. The object: to allow an ARRL member to send DX cards with a minimum of cost and work on behalf of the individual member.

Here's How It Works

Each month, every member of the ARRL (except family and blind members) is mailed a copy of *QST*. The address label on the wrapper of *QST* is the member's "ticket" for use of the Outgoing QSL Service. Twelve times per year, an ARRL member may send as many QSL cards as he or she wants for amateurs overseas in the countries shown in Table 1. With each mailing the member must include the address label from *QST* and $1, check or money order, per pound of cards or portion thereof (there are approximately 155 cards in a pound). QSLs must be presorted by prefix. Nothing but the cards, address label and remittance may be included in the package. Wrap the package securely and address it to ARRL Membership Outgoing QSL Service, 225 Main St., Newington, CT 06111.

ARRL family members (only one copy of *QST* is sent per family) may send cards in the same package but must include remittance for each member sending cards and indicate that the *QST* address label includes a "family membership."

Blind members, who do not receive a copy of *QST*, need only include the appropriate fee with a note indicating that the cards are from a blind member. Associate (unlicensed) members may use the Outgoing QSL Service to send SWL reports to overseas *amateur* stations in the countries shown in Table 1. No cards will be sent to individual QSL managers.

Your cards are "turned around" quickly by the Bureau, and are on their way overseas usually within a week of their arrival at ARRL Hq. Obviously, considerable time is necessary for the cards to make the journey. Add to that the time needed for the card from the DX station to make its way to you via the ARRL Incoming QSL Bureau,[1] and a delay of many months is not unusual. What you sacrifice in speed, you gain in convenience and savings. Of course, you may still wish to QSL individually in certain cases.

Headquarters sincerely hopes that this membership service will be fully used. Keep us busy serving you!

[1] See "Your Incoming QSL Bureau," *QST*, Nov. 1980, p. 54.

Recommended QSL-Card Dimensions

The efficient operation of the worldwide system of QSL bureaus requires that cards be easy to handle and sort. Cards of unusual dimensions, either much larger or much smaller than normal, slow the work of the bureaus, most of which is done by unpaid volunteers. A review of the cards received by the ARRL bureau indicates that most fall in the following range:
Height = 2-3/4 to 4-1/4 in. (70 to 110 mm)
Width = 4-3/4 to 6-1/4 in. (120 to 160 mm).
Cards in this range can be easily sorted, stacked and packaged. Cards outside this range create problems; in particular, the larger cards often cannot be handled without folding or otherwise damaging them. In the interest of efficient operation of the worldwide QSL bureau system, it is recommended that cards entering the system be limited to the range of dimensions given.

Table 1

Countries for Which the ARRL-Membership Outgoing QSL Service May Be Used

Afghanistan
Alaska
Algeria
Angola
Antarctica
Antigua
Argentina
Ascension Island
Austral/French Antarctic Lands
Australia
Austria
Azores
Bahama Islands
Bahrain
Barbados
Belgium
Bermuda
Bolivia
Brazil
Bulgaria
Canada
Cape Verde Islands
Cayman Island
Chile
Colombia
Cook Islands
Costa Rica
Cuba
Cyprus
Czechoslovakia
Denmark
Dominica
Dominican Rep.
Ecuador
Egypt
El Salvador
Ethiopia
Falkland Islands
Faroe Islands
Fiji Islands
Finland
France
French Guiana
French Oceania
German Dem. Rep.
Germany, Fed. Rep. of
Ghana
Gibraltar
Grenada
Great Britain (or British Commonwealth)
Greece
Greenland
Guadaloupe
Guam
Guantanamo Bay
Guatemala
Guyana
Haiti
Hawaiian Islands
Honduras
Hong Kong
Hungary
Iceland
India
Indonesia
Ireland
Israel
Italy
ITU-Geneva
Ivory Coast
Jamaica
Jan Mayen
Japan
Johnston Island
Jordan
Kenya
Korea
Kuwait
Lesotho
Liberia
Liechtenstein
Luxembourg
Madeira Islands
Malagasy Republic
Malawi
Malaysia
Maldives
Malta
Mariana Islands
Marshall Islands
Mauritius
Mexico
Midway Islands
Monaco
Mongolia
Morocco
Nauru
Netherlands
Netherlands Antilles
New Caledonia
New Zealand
Nicaragua
Nigeria
Northern Ireland
Norway
Oman
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippine Islands
Poland
Portugal
Puerto Rico
Republic of China
Romania
Rwanda
Somoa (American)
San Marino
Scotland
Senegal
Seychelles
Seirra Leone
Singapore
South Africa
Spain
Sri Lanka
St. Helena
St. Lucia
St. Vincent
Surinam
Svalbard
Swaziland
Sweden
Switzerland
Syria
Thailand
Togo
Tonga
Transkei
Trinidad and Tobago
Turkey
Uruguay
USSR
Vatican
Venezuela
Virgin Islands
Wales
Western Somoa
Yugoslavia
Zaire
Zambia
Zimbabwe

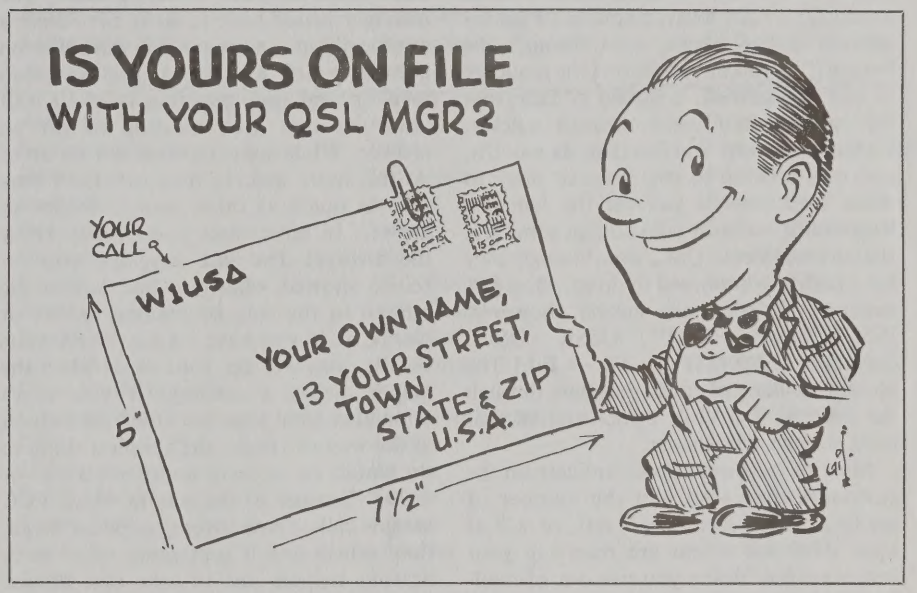
Your Incoming QSL Bureau . . .

. . . What it is and how it works.

By Jesse Bieberman,* W3KT

You have just discovered the world of DX! You have had the thrill of working your first foreign stations. Naturally you are anxious to get QSLs to confirm these QSOs, and you have asked the DX stations to QSL direct to your home QTH, but in just about every case he has responded with "sure QSL via the bureau." You have tried to get your full QTH across to the DX stations, for a direct QSL, but he was not really interested.

Why does he insist on this "QSL via bureau" thing? You must remember that stations outside the USA and Canada can work us with the greatest of ease and can put literally thousands of W/VE stations in their logs in a relatively short period of time. An active DX station would find the financial burden of QSLing direct to his W/VE QSOs very great indeed, and in addition he might not have a recent *Callbook*. So, he sends his QSLs to your bureau, either direct or via his own national amateur organization. Okay, so what is a QSL Bureau, how do you get your cards from it and how soon can you get your cards?



Where Are the Bureaus?

The Incoming QSL Bureaus in the U.S. and Canada are sponsored by ARRL/CRRL. Every amateur should be an ARRL member, but you don't have to belong to the ARRL to use the Incoming Bureaus.[1] There is an ARRL Incoming QSL Bureau for each U.S. and Canadian call area, and there are also bureaus in Hawaii, Alaska, Puerto Rico and other U.S. possessions. Your DX QSLs will come to the bureau in your call area, the one in which you are licensed. Thus, if you operate as W3XYZ/6 your QSLs will arrive at the third call-area QSL Bureau, not the sixth. The addresses of these bureaus appear every other month in *QST* in the "QSL Corner" column. They are also listed on page 68 of the new League publication, *The ARRL Operating Manual*. You should get the address of your bureau from a current list.

The QSLs reach the bureaus in various ways. Some come direct from individual DX stations; others are sent by the bureaus in foreign countries. Many DX cards are sent to ARRL headquarters, where they are sorted by call area and passed along to the bureaus.

What Happens at the Bureaus?

You might envision a large pigeonhole-filled room with a large, well-paid, full-time staff, cheerfully stuffing QSL cards into the pigeonholes. Not so; the bureaus are usually operated by a manager with the assistance of a few local hams (or non hams!) plus up to 50 or more "helpers," who are normally members of a sponsoring club. The manager and his assistants sort the cards into 26 groups, by the first letter following the number in the call, and distribute the cards to the helpers. The helpers sort the cards by individual calls, and at some convenient time, mail them out.

This is where your part of the job comes in. The first thing you need to do is find out how your bureau works, since they do not all operate in exactly the same way. Don't depend on word-of-mouth information on the bureau. This kind of information may be inaccurate or out-of-date. Write to your bureau for the latest information — and please enclose a self-addressed stamped envelope (s.a.s.e.), not a postcard. Many of the bureau managers prefer not to transact bureau business over the telephone. Over half of the bureaus prefer a system by which you pay for mailing credits, which will be explained on the information card you get from the bureau, but all bureaus will accept s.a.s.e.'s. If you are going to send s.a.s.e.'s, don't send just any old envelope — 5- × 7-1/2-inch envelopes will be accepted by most bureaus. These envelopes must be addressed to yourself, have your call plainly printed in the upper left hand corner and be stamped. Put at least one unit of postage on each envelope, or if you expect a lot of cards, put enough

*RD 1, Box 66, Valley Hill Rd., Malvern, PA 19355

[1]This article deals strictly with the operation of the Incoming QSL Bureau system. ARRL also sponsors an Outgoing Bureau, which is restricted to League members only. See "QSL Corner" every other month for details on how to use the Outgoing Bureau.

postage on each envelope to carry several ounces of cards, up to what would be a sensible limit on how much weight can be put in one envelope without causing it to break open in transit. Don't be too optimistic! Cards come through slowly, as you will learn, and when you place postage for 6 ounces on your s.a.s.e. you are telling the bureau to hold your envelope until it has about 50 cards. This may take a long time, unless you are very active. Don't send too many s.a.s.e.'s. They can create a storage problem. The bureau will usually accept four envelopes. After you have sent either funds or s.a.s.e.'s, sit back and wait — patiently.

"But why," you ask, "do I have to be so patient? After all, the DX station said he would QSL right away. Shouldn't I get his card in a few weeks, even through the bureau?" If you have followed the sequence of events described, it should be clear that the cards cannot come through quickly. Cards seldom arrive in less than six months, and may take up to two years or more to make their way to you via the bureaus. Regretfully, we must tell you that some DX stations will never QSL, even though they have faithfully promised to do so. Most DX stations will eventually answer, however. [See "How's DX?" USSR QSLs, September 1980 *QST*, p. 67. — Ed.] The literally millions of cards that pass through the bureaus is a vivid demonstration that most stations will answer.

Most of the bureaus will indicate on the envelopes they send you the number of mailing credits or s.a.s.e.'s left, or will at least show when you are receiving your last envelope. When you run out of mailing credits or s.a.s.e.'s, you should *immediately* send more — don't wait! Do it at once! As you must have gathered by now, running a QSL bureau is a big job, and one of the greatest problems is the accumulation of uncollected cards. You should either send for your cards on a continuing basis, or, if you have no interest in QSLs, at least notify the bureau that you will not be collecting them and that they may be discarded. In general, the ARRL bureaus do not return uncollected cards to the DX stations. [The ARRL Board of Directors voted, at their July 1980 meeting, that the QSL bureau guideline for card retention be changed from one year to 90 days. — Ed.]

Volunteers Operate the Bureaus

I've tried to explain how the QSL Bureaus operate. It's a big job. Try to understand the problems of the bureau and cooperate with it. Remember, the people who operate the bureaus are volunteers, and they must do the work in their spare time. Most of the managers and helpers hold down full-time jobs; they may have families to raise; chores to do around the home and they even like to do a little hamming now and then. If you think you have a problem with your QSL Bureau, it is your privilege to write to ARRL hq. about it. But you must remember that Headquarters does not have the answers to your questions and they can only ask the bureau manager to check. You may as well write directly to the manager. It is usually not possible to write to the helper, who is, in most cases, anonymous. If you do write to the bureau manager, enclose an s.a.s.e. Remember, the manager cannot answer such questions as: "How many mailing credits do I have left? How many s.a.s.e.'s do you have on file for me? Are there any QSLs at the bureau for me? Will you please send me any cards you have for me?" All this information is in the hands of the helper who handles your letter group. The manager would have to write the helper a note, call him on the phone, work him on a 2-meter net, ask him at the next club meeting and then possibly have to wait until the next club meeting to get an answer. While some bureaus are set up to do this more quickly than others, it may take as much as three months to get an answer. In most cases you already know the answer! The last envelope you received showed what you had left in the bureau in the way of mailing credits or s.a.s.e.'s. If you have s.a.s.e.'s or credits on file, you will get your cards when the helper makes a mailing. If you don't remember what your last envelope showed in the way of credit, the simplest thing to do would be to send another s.a.s.e. or dollar. Because of the way in which FCC assigns calls, some letter groups are larger than others and it sometimes takes three or four helpers just to take care of one group. The man in charge of one such group tells me that he spends eight to 10 hours a week just taking care of his letter. How many of you are prepared to take on that big a job?

While the ideal situation would be for each helper to make a mailing once a month (or less) — and some helpers in some bureaus still manage to do this — it is not realistic to expect this to happen with the larger groups. Some are only able to manage to make a mailing every two or three months. Even a QSL Bureau helper has other commitments and may have a period of illness or go on a vacation. Again, please be patient and understanding, unless you are willing to take over the bureau managership yourself and have about 50 helpers ready to work with you. You would be surprised how quickly you could become a QSL Bureau manager! QST

The author is ARRL Atlantic Division Director, a member of the International Affairs Committee and operated the Third Call Area QSL bureau for 33 years, until November 1, 1979. His main operating activity is DX — he's on the DXCC Honor Roll in the mixed, phone and cw categories.

HELPFUL HINTS

Good cooperation between the DXer and the bureau is important to ensure a smooth flow of cards. Remember that the people who work in the area bureaus are volunteers. They are providing you with a free but valuable service. With that thought in mind, please pay close attention to the following DOs and DONTs.

DOs

Do keep self-addressed 5 X 7 1/2" envelopes on file at your bureau, with your call in the upper left corner, and affix at least one unit of first-class postage.

Do send the bureau enough postage to cover envelopes on file and enough to take care of possible postage rate increases.

Do respond quickly to any bureau request for envelopes, stamps or money. Unclaimed card backlogs are the bureau's biggest problem.

Do notify the bureau of your new call as you upgrade.

Do include an s.a.s.e. with any information request to the bureau.

Do notify the bureau in writing if you don't want your cards.

Do be appreciative of the fine efforts of these volunteers.

DON'Ts

Don't expect DX cards to arrive for several months after the QSO. Overseas delivery is very slow. Many cards coming from overseas bureaus are over a year old.

Don't send your outgoing DX cards to this bureau (see the bulletin, "ARRL - Membership Overseas QSL Service").

Don't send envelopes to your "portable" bureau. For example, WA1SQB/2 sends envelopes to the W1 bureau, not the W2 bureau.

ARRL — MEMBERSHIP OUTGOING QSL SERVICE

(SEND OUTGOING CARDS TO THIS ADDRESS)

AMERICAN RADIO RELAY LEAGUE

225 MAIN STREET

NEWINGTON, CONN. U.S.A. 06111

This is a current list of countries for which QSLs may be forwarded. Keep in mind that QSLs received for countries that do not have bureaus will be held until such time as a distribution point exists. In the interest of economics and efficiency, QSLs cannot be returned.

Purpose

This is an "outgoing" service that allows ARRL members to send DX QSL cards to foreign countries at a minimum of cost and effort.

Advantages

While QSLing direct to foreign amateurs is faster, it is also more tedious. Time spent searching for addresses in the foreign Callbook, addressing and stuffing envelopes, and mailing could be better spent operating DX. And, the cost of IRCs, airmail postage, and envelopes can be prohibitive.

An unlimited number of QSLs may be sent for distribution 12 times a year. The fee is just $1.00 per pound or portion thereof (155 QSL cards average a pound).

Additional Notes

The ARRL-Membership Outgoing QSL Service operates ONLY in an "outgoing" capacity. To receive QSLs from DX stations, see the information sheet entitled The ARRL INCOMING QSL BUREAU SYSTEM.

U.S. amateurs may send SWL reports to foreign short-wave listeners.

Unlicensed (associate) members may send SWL cards to foreign amateurs.

QSL managers: Write for details.

Requirements

1. Pre-sort your DX QSLs alphabetically by callsign prefix (A3, AP, C6, CE, F, FG, G, GI, GM, JA, 3A2, etc.).
2. Enclose the address label from the brown wrapper of your current copy of ***QST***. This information shows that you are a current ARRL member.
   Family members may also use the service by enclosing their QSLs with those of the primary member. Include the appropriate fee with each individuals cards and indicate "family membership."
   Sightless members who do not receive ***QST*** should indicate that the QSLs are from a "sightless member."
   ARRL affiliated club stations may utilize the service when submitting club QSLs by indicating the club name. Club secretaries should check affiliation papers to ensure that membership is current.
3. Enclose payment in the form of a check, money order, or cash.
   It is helpful if call is stated on check.

Sending large amounts of cash through the mail is not suggested. Please do not send stamps.

Afghanistan
Alaska
Algeria
Angola
Antarctica*
Antigua
Argentina
Ascension Island
Australia
Austria
Azores
Bahama Islands
Bahrain
Barbados
Belgium
Bermuda
Bolivia
Brazil
Bulgaria
Canada
Cape Verde Islands
Cayman Island
Chile
Colombia
Cook Islands
Costa Rica
Cuba
Cyprus
Czechoslovakia
Denmark
Dominiça
Dominican Rep.
Ecuador
Egypt
El Salvador
Ethiopia
Falkland Islands
Faroe Islands
Fiji Islands
Finland
France
French Guiana
French Polynesia
German Dem. Rep.
Germany, Fed. Rep. of
Ghana
Gibraltar
Grenada
Great Britain
(or British Commonwealth)
Greece
Greenland
Guadaloupe
Guam
Guantanamo Bay
Guatemala
Guyana
Haiti
Hawaiian Islands
Honduras
Hong Kong
Hungary
Iceland
India
Indonesia
Ireland
Israel
Italy
ITU - Geneva
Ivory Coast
Jamaica
Jan Mayen
Japan
Johnston Island
Jordan
Kenya
Korea
Kuwait
Lesotho
Liberia
Liechtenstein
Luxembourg
Madeira Islands
Malagasy Republic
Malawi
Malaysia
Maldives
Malta
Mariana Islands
Marshall Islands
Mauritius
Mexico
Midway Islands
Monaco
Mongolia
Morocco
Nauru
Netherlands
Netherlands Antilles
New Caledonia
New Zealand
Nicaragua
Nigeria
Northern Ireland
Norway
Oman
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippine Islands
Poland
Portugal
Puerto Rico
Republic of China (Taiwan)
Romania
Rwanda
Samoa (American)
San Marino
Scotland
Senegal
Seychelles
Sierra Leone
Singapore
South Africa
Spain
Sri Lanka
St. Helena
St. Lucia
St. Vincent
Surinam
Svalbard
Swaziland
Sweden
Switzerland
Syria
Thailand
Togo
Tonga
Transkei
Trinidad and Tobago
Turkey
Uruguay
U.S.S.R.
Vatican
Venezuela
Virgin Islands
Wales
Western Samoa
Yugoslavia
Zaire
Zambia
Zimbabwe

*QSL via country under whose auspices the particular station is operating.

MS/Q-3 8205

THE ARRL INCOMING QSL BUREAU SYSTEM

Purpose

Within the U.S. and Canada, the ARRL DX QSL Bureau System is made up of 27 call area bureaus that act as central clearing houses for QSLs arriving from foreign countries. These "incoming" bureaus are staffed by volunteer workers. The service is free and ARRL membership is not required.

How it Works

Most countries have "outgoing" QSL bureaus that operate in much the same manner as the ARRL-Membership Outgoing QSL Service. The member sends his cards to his outgoing bureau where they are packaged and shipped to the appropriate countries.

A majority of the DX QSLs are shipped directly to the individual incoming bureaus where volunteer workers sort the incoming QSLs by the first letter of the call sign suffix. One individual may be assigned the responsibility of handling from one to three letters of the alphabet.

Claiming your QSLs

Send a 5 x 7½ inch self-addressed, stamped envelope to the bureau serving your district. Neatly print your call sign in the upper left corner of the envelope. A preferred way to send envelopes is to affix a first class stamp and clip extra postage to the envelope. Then, if you receive more than 1 oz. of cards, they can be sent in the single package.

Some incoming bureaus sell envelopes or postage credits in addition to the normal handling of s.a.s.e.s. They provide the proper envelope and postage upon the prepayment of a certain fee. **The exact arrangements can be obtained by sending your inquiry with an s.a.s.e. to your area bureau.** A list of bureaus can be found below.

Helpful Hints

Good cooperation between the DXer and the bureau is important to ensure a smooth flow of cards. Remember that the people who work in the area bureaus are volunteers. They are providing you with a valuable service. With that thought in mind, please pay close attention to the following DOs and DON'Ts.

DOs

Do keep self-addressed 5 x 7½ envelopes on file at your bureau, with your call in the upper left corner, and affix at least one unit of first-class postage.

Do send the bureau enough postage to cover envelopes on file and enough to take care of possible postage rate increases.

Do respond quickly to any bureau request for envelopes, stamps or money. Unclaimed card backlogs are the bureau's biggest problem.

Do notify the bureau of your new call as you upgrade. Please send envelopes with new call, in addition to envelopes with old call.

Do include an s.a.s.e. with any information request to the bureau.

Do notify the bureau **in writing** if you **don't** want your cards.

DON'Ts

Don't expect DX Cards to arrive for several months after the QSO. Overseas delivery is very slow. Many cards coming from overseas bureaus are over a year old.

Don't send your outgoing DX cards to this bureau (see the bulletin, "ARRL-Membership Outgoing QSL Service").

Don't send envelopes to your "portable" bureau. For example, WA1SQB/2 sends envelopes to the W1 bureau, **not** the W2 bureau.

ARRL DX QSL BUREAU SYSTEM

First Call Area: all calls* - Hampden County Radio Association, Box 216, Forest Park Station, Springfield, MA 01108.

Second Call Area: all calls* - N.J.D.X.A., P.O. Box 599, Morris Plains, N.J., 07950

Third Call Area: all calls* - Leon Lapkiewicz (K3GM), P.O. Box 6238, Philadelphia, PA 19136

Fourth Call Area: All single-letter prefixes - Mecklenburg Amateur Radio Club, P.O. Box DX, Charlotte, NC 28220

Fourth Call Area: All two-letter prefixes - Sterling Park Amateur Radio Club, P.O. Box 599, Sterling Park, VA 22170

Fifth Call Area - all calls* - ARRL W5 QSL Bureau, Box 1690, Sherman, TX 75090

Sixth Call Area: All calls* - ARRL Sixth (6th) District DX QSL Bureau, P.O. Box 1460, Sun Valley, CA 91352

Seventh Call Area: all calls - Willamette Valley DX Club, Inc., P.O. Box 555, Portland, OR 97207

Eighth Call Area: all calls - Columbus Amateur Radio Assn., Radio Room, 280 E. Broad St., Columbus, OH 43215

Ninth Call Area: all calls* - Northern Illinois DX Assn., Box 519, Elmhurst, IL 60126

Zero Call Area: all calls* - WØQSL Bureau, Ak-Sar-Ben Radio Club, P.O. Box 291, Omaha, NE 68101

Puerto Rico: all calls* - Radio Club de Puerto Rico, P.O. Box 1061, San Juan, PR 00902

U.S. Virgin Islands: all calls - Graciano Belardo, KV4CF, P.O. Box 572, Christiansted, St. Croix, VI 00820

Canal Zone: all calls* - L P R A HP, P.O. 9A-175, Panama 9A, Republic of Panama

Hawaiian Islands: all calls* - John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, HI 96701

Alaska: all calls* - Alaska QSL Bureau, 4304 Garfield St., Anchorage, AK 99503

Guam: AH2, KH2, WH2 and, KG6 calls: MARC, Box 445, Agana, Guam 96910

SWL - Leroy Waite, 39 Hannum St., Ballston Spa, NY 12020

QSL Cards for Canada (VE and VO) may be sent to: CRRL Central QSL Bureau, Kennebcasis Valley Amateur Radio Club, Box 51, St. John, N.B. E2L 3X1. Or, QSL cards may be sent to the individual bureaus.

VE1* - L.J. Fader, VE1FQ, P.O. Box 663, Halifax, NS B3J 2T3.

VE2 - A.G. Daemen, VE2IJ, 2960 Douglas Ave., Montreal, Quebec H3R 2E3

VE3 - The Ontario Trilliums, P.O. Box 157, Downsview, Ont. M3M 3A3.

VE4* - L.R. Lazar, VE4SL, 30 Bathgate Bay, Winnipeg, Manitoba, R3T 0L2

VE5 - Charles Zsoka, VE5AAD, 1108 Walker St., Regina, Sask. S4T 5N4

VE6* - G.D. Holeton, VE6AGV, 4003 First St., N.W., Calgary, Alta, T2K 0X2.

VE7* - Burnaby ARC, Box 80555 South Burnaby, B.C. V5H 3X9

VE8* - Rolf Ziemann, VE8RZ, 2888 Lanky Court, Yellowknife, N.W.T., X1A 2G4.

VY1 - W.L. Champagne, VY1AU, P.O. Box 4597, Whitehorse, Yukon, Y1A 2R8

VO1, VO2 - CRRL VO QSL Bureau, P.O. Box 6, St. John's, Nfld. A1C 5H5.

* These bureaus sell envelopes or postage credits. Send an s.a.s.e. to the bureau for further information.

MS/Q4 8205